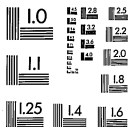




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Folio No. 206

Serial No. 290, 936

Applicant.

Address.

Thomas Edison

Title Process of making Methylene films or plates

Filed Dec. 5, 1905

Examiner's Room No. _____

Assignee _____

Ass'g't Exec. _____

Recorded _____

Liber. _____

Page _____

Patent No. _____

Issued _____

ACTIONS.

- 1 Office Letter, Jan. 9, 1906 16
- 2 Included Rec. 29, 1906 17
- 3 Abandoned Jan. 17, 1907 18
- 4 in form of an application filed 19
- 5 Jan. 18, 1907 Serial #353002 20
- 6 Polis 286- 21
- 7 _____ 22
- 8 _____ 23
- 9 _____ 24
- 10 _____ 25
- 11 _____ 26
- 12 _____ 27
- 13 _____ 28
- 14 _____ 29
- 15 _____ 30

FRANK L. DYER,

Counsel,

Orange, New Jersey.

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS ALVA EDISON,
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, County of Essex and State of New Jersey,

prays that letters patent may be granted to him for the improvements in

PROCESS OF MAKING METALLIC FILMS OR SLAKES,

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Edison Laboratory, Orange, New Jersey, his
attorney, with full power of substitution and revocation, to prosecute this
application, to make alterations and amendments therein, to receive the patent,
and to transact all business in the Patent Office connected therewith.

Thomas A. Edison

-SPECIFICATION-

TO ALL WHOM IT MAY CONCERN:

Be it known that I, THOMAS ALVA EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, in the County of Essex and State of New Jersey, have invented a certain new and useful PROCESS OF MAKING METALLIC FILMS OR FLAKES, of which the following is a description:

My invention relates to an improved process of making metallic films or flakes, and particularly flakes of metallic cobalt or cobalt-nickel alloy, for use in the make-up of the positive electrodes of storage batteries of the Edison type. As I have previously indicated, flakes of metallic cobalt or cobalt-nickel alloy are peculiarly fitted for this use, owing to the high character of the contact which will be afforded for the particles of active material, such as nickel hydroxide, as well as the permanency of the flakes under the effect of electrolysis. In an application for Letters Patent filed March 30th, 1905, Serial No. 252,932, I describe a process for this purpose in which the flakes are formed by depositing electrolytically upon a cathode layers or films of a soluble metal alternating with successive films of the desired metal (cobalt or cobalt-nickel) after which the soluble metal is dissolved, so as to result in the separation and segregation of the cobalt or cobalt-nickel films. In the application referred to, I describe the use of zinc as a suitable soluble metal, and I describe the breaking up or sizing

of the cobalt or cobalt-nickel flakes by means of a screening operation. My present invention relates to an improvement on the process described in said application by which flakes of cobalt or cobalt-nickel can be secured which will be very much smoother, of more uniform thickness and more coherent than when zinc is used, and which flakes will also be more uniform in size than when sub-divided by a screening operation.

To this end the invention consists, broadly speaking, first in making use of copper as the soluble metal on which the films of cobalt or cobalt-nickel are deposited, and second, in cutting up the composite strips or sheets to the required size after separation of the same from the cathode. The invention also contemplates details of procedure, all as will be more fully hereinafter described and claimed.

In carrying my invention into effect, I proceed substantially as follows:

The cathode consists of a plate or cylinder of polished copper, preferably nickel-plated, and which may be conveniently rotated during the plating and subsequent operations, as I describe in my application for Letters Patent filed October 12, 1905, Serial No. 282,380. The cathode is first rubbed with graphite so as to polish the surface thereof and permit the effective separation of the deposited composite sheet. I first introduce the cathode in a copper plating bath employing any suitable copper salt, such as the sulphate thereof with metallic copper anodes and deposit a thin layer or film of copper on the cathode, as will be understood. Such a copper layer will be extremely smooth and coherent and in this respect very superior to zinc. The cathode is now washed and then

immersed in a cobalt or cobalt-nickel bath, the solution used being preferably an ammonium sulphate solution of the metal or metals to be plated, and anodes of cobalt or of cobalt and nickel being employed. In the latter case, the anodes and the depositing current will be so regulated as to secure the desired relative deposit of the two metals. When the cobalt or cobalt-nickel film has been thus deposited on the copper film, the cathode is again washed, returned to the copper bath and a second layer of copper is deposited on the cobalt or cobalt-nickel film. After washing, a second film of cobalt or cobalt-nickel is deposited on the second copper film, and these operations are continued until a sufficient number of layers of copper and cobalt or cobalt-nickel are secured. The composite sheet thus obtained on the cathode is easily stripped from the same by cutting the sheet longitudinally, so as to permit the sheet to be peeled off. To facilitate this cutting of the composite sheet, the cathode is formed with one or more longitudinal grooves which act as effective guides for the cutter. After the sheet has been thus separated from the cathode, it is preferably cut up into strips about three inches wide, and these strips are subdivided by means of a suitable cutting machine of any desired type, into squares or other forms, the dimensions of which in length and breadth determine the ultimate size of the flakes to be produced. Ordinarily, each flake will be about 1/16 of an inch square. At this stage of the method, I will obtain a great number of very small squares or bodies each formed of successive and alternating layers of copper and cobalt or cobalt-nickel, as will be understood. It now becomes necessary to dissolve the copper without affecting the cobalt or cobalt-nickel flakes, thereby eliminating the copper and separating the flakes desired. This

is preferably effected by soaking the sub-divided composite bodies in a very strong solution of cyanide of potassium, and agitated at times during the treatment. The effect of the cyanide is to dissolve the metallic copper, without appreciably affecting the cobalt or cobalt-nickel, thus freeing the flakes of cobalt or cobalt-nickel and effectively separating the same. These flakes may now be used directly in the make-up of the battery electrodes or they may be first annealed in hydrogen before such use. In applying the cobalt or cobalt-nickel flakes to the active particles, I prefer to make use of the process described in my ~~Application for Letters Patent filed March 6th,~~ ^{Patent dated December 25, 1906 No 839371} Serial No. 252,933, wherein the active particles are first coated with a sticky material, such as molasses or glucose, after which the conducting flakes are added, and will be caused to adhere to the surfaces of the active particles to thereby coat the same in the most effective manner. If

desired, instead of directly subjecting the composite bodies to the action of a solvent of copper, such as cyanide of potassium as explained, it will be possible to subject the composite bodies to a treatment by which the copper will be converted to a soluble copper salt, after which the latter will be dissolved by a solvent thereof. Thus, the composite bodies after their sub-division may be first soaked in a strong solution of sulphide of potash or soda until all of the metallic copper is converted to the sulphide thereof, after which the mass is washed free of the alkaline sulphide and is then subjected to a bath of a very strong solution of cyanide of potassium, until the copper sulphide is thoroughly dissolved, so as to separate and segregate the cobalt or cobalt-nickel flakes. The sulphide does not attack the cobalt.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is as follows:-

1.- The process of making films or flakes of cobalt or cobalt-nickel, which consists in depositing on a suitable cathode a layer or film of copper, then in depositing on the copper film a layer or film of cobalt or cobalt-nickel, and in finally dissolving the deposited copper to free the film of cobalt or cobalt-nickel, substantially as set forth.

2.- The process of making films or flakes of cobalt or cobalt-nickel, which consists in depositing upon a suitable cathode a layer or film of copper, then in depositing on the copper a layer or film of cobalt or cobalt-nickel, then in separating the composite sheet from the cathode and in finally dissolving the deposited copper film to free the film of cobalt or cobalt-nickel, substantially as set forth.

3.- The process of making films or flakes of cobalt or cobalt-nickel, which consists in depositing upon a suitable cathode a layer or film of copper, then in depositing upon the copper film a layer or film of cobalt or cobalt-nickel, then in separating the composite sheet from the cathode, then in cutting up the composite sheet into bodies of the ultimate shape and size and in finally dissolving the copper to free the deposited cobalt or cobalt-nickel, substantially as set forth.

4.- The process of making films or flakes of cobalt or cobalt-nickel, which consists in depositing upon a suitable cathode a layer or film of a soluble metal, then

in depositing on the soluble film a layer or film of cobalt or cobalt-nickel, then in separating the composite sheet from the cathode, then in cutting up the composite sheet into bodies of the ultimate shape and size and in finally dissolving the soluble metal to free the flakes of cobalt or cobalt-nickel, substantially as set forth.

5.- The process of making films or flakes of cobalt or cobalt-nickel, which consists in depositing upon a suitable cathode successive and alternating layers of copper and cobalt or cobalt-nickel, and in finally dissolving the copper to free the films of cobalt or cobalt-nickel, substantially as set forth.

6.- The process of making films or flakes of cobalt or cobalt-nickel, which consists in applying graphite to a suitable cathode, then in depositing a layer or film of copper thereon, then in depositing on the copper film a layer or film of cobalt or cobalt-nickel, and in finally dissolving the copper to free the film of cobalt or cobalt-nickel, substantially as set forth.

7.- The process of making films or flakes of cobalt or cobalt-nickel, which consists in depositing upon a suitable cathode a layer or film of copper, then in depositing a layer or film of cobalt or cobalt-nickel on the copper film, and in finally subjecting the composite sheet so formed to the action of a cyanide of an alkali to dissolve the copper and free the deposited cobalt or cobalt-nickel, substantially as set forth.

*Cancelled
Dec. 17, 1906*

~~8.- The process of making films or flakes of cobalt or cobalt-nickel, which consists in depositing on a suitable cathode a layer or film of copper, then in depositing a layer or film of cobalt or cobalt-nickel on the copper~~

film, then in subjecting the composite so formed to the action of an alkaline sulphide to convert the copper into the sulphide thereof, and in finally subjecting the sheet to the action of cyanide of an alkali to dissolve the copper sulphide and free the deposited cobalt or cobalt-nickel, substantially as set forth.

This specification signed and witnessed this 28 day of Nov. 1905

Witnesses:

1. Frank L. Dyer
2. Miss C. MacArthur

Oath.

State of New Jersey }
County of Essex } ss.,

THOMAS ALVA EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Orange, County of Essex and State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the improvements in PROCESS OF MAKING METALLIC FILMS OR FLAKES,

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 28 day of Nov. 1905

[Seal]

Thomas Edison
Frank L. Dyer
Notary Public.

204

2-260.

Div. Room 175.
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

128

Paper No. 1
All communications regarding this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

January 9, 1906.

Thomas A. Edison,

C/o Frank L. Dyer,

Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application,

Ser. No. 290,336, filed December 5, 1905:

"Process of Making Metallic Films or Flakes"

F. L. Allen
Commissioner of Patents.

Page 4, the specification should set forth an advantage in the alternative step of converting the copper into a sulphide previous to dissolving in potassium cyanide.

Claim 8, line 5, the word sheet should be inserted after "composite".

The process covered by claim 8 is obviously distinct and independent from the process covered by the remaining claims. The claims are therefore rejected, and action upon the merits is suspended.

No pertinent references appear to exist in the prior art.

Dec. 29, 1906.

Messrs. Bacon & Milans,
908 - G Street,
Washington, D.C.

Gentlemen:-

I enclose amendment in application of Thomas A. Edison, for Process of Making Metallic Films or Flakes, filed December 5th, 1905, Serial No. 390,336, Examiner's Room No. 175. This amendment requires to be filed on or before January 9th, 1907. Please file the amendment and advise me when you have done so.

Yours very truly,

FLP/ARK.
Enc.

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,

Process of Making Metallic }
Films or Flakes, }

Room No. 175.

Filed December 5th, 1905, }

Serial No. 290,336.

HONORABLE COMMISSIONER OF PATENTS,

S I R : -

Please amend as follows:-

Page 3, line 18, the word "composute" should be -
composite.

Page 4, lines 12 and 13, erase "application for
Letters Patent, filed March 30th, Serial No. 252,931" and
substitute - patent dated December 25th, 1906, numbered
839,371. Same page, beginning with the word "It", line 17,
erase through the bottom of the page.

Cancel claim 8.

- R E M A R K S -

Applicant has cancelled the matter on page 4, be-
cause he does not consider it so desirable to carry on the
process suggested therein by first converting the copper
to a soluble salt thereof. Applicant considers it better
to dissolve the copper in the first instance, rather than
to complicate the process by introducing the additional
step of converting the metallic copper to a copper salt.
Of course, such an expedient could be adopted and would be
covered by the broad language of the claims, but applicant

cannot perceive any advantage in following it, and it has therefore been considered better to erase this matter, together with the claim relating to the same.

Very respectfully,

THOMAS A. EDISON,

By

L. L. D.

Orange, New Jersey,

His Attorney.

December 29th, 1906.

L. S. BACON,
ATTORNEY AT LAW.

J. H. MILANS,
ATTORNEY AT LAW.

709

BACON & MILANS,
ATTORNEYS AND SOLICITORS IN PATENT CAUSES,
NO. 908 G STREET, NORTHWEST.
(ROOMS, 410-415)

CABLE ADDRESS, "BACAM."
LONG DISTANCE TELEPHONE.

WASHINGTON, D. C. Dec. 31, 1906.

Frank L. Dyer, Esq.,
Orange, N. J.

Dear Sir:

We are in receipt of your favor of the 29th instant,
enclosing amendment in application of Thos. A. Edison, for pro-
cess of making metallic films or flakes, filed Dec. 5, 1906,
Sr. No. 390,336. The amendment was filed in the Patent
Office today and received the date of Dec. 31st.

Yours very truly,

R-H.

Bacon & Milans

AMOUNT CHARGE.

Date *Dec. 31/06*
Attorneys *Edison*
Items *Sec. no*
amend. Appl. of
T. A. Edison, ser.
390,336
Amount *\$1.00*

BACON & MILANS.

ORANGE, NEW JERSEY, January 17, 1907

HONORABLE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

Sir :--

In reference to application for letters patent filed December 5, 1905, serial No.290,336, for PROCESS OF MAKING METALLIC FILMS OR PLATES, I hereby abandon the said application (but not the invention described and claimed therein) in favor of an application similarly entitled, which I have executed on even date herewith.

My object in abandoning the said application and in filing a new application on the same invention, is for the purpose of specifically referring to the fact that the process may be used for the production of nickel films. To a chemist, I believe this fact would be instantly perceived since the application specifically refers to the making of cobalt films and to the making of cobalt-nickel films, but rather than to incur any risk whatever I will, on advice of counsel, file a new application in which the manufacture of nickel films is specifically referred to and the claims are correspondingly changed to include the same.

Very respectfully,

Thos. A Edison

In presence of:

Francis L. Dyer

Folio No. 211Serial No. 290,712

Applicant.

Address.

Thomas A. EdisonTitle Storage Battery ReceptaclesFiled December 7, 1905Examiner's Room No. 17

Assignee

Ass'g't Exec. _____ Recorded _____ Liber _____ Page _____

Patent No. _____ Issued _____

ACTIONS.

- | | |
|--|----------------------------------|
| 1. <u>Rejected May 4/06</u> | 16. <u>Rejected Jan. 3, 1913</u> |
| 2. <u>Amended Sept. 12, 1906</u> | 17. _____ |
| 3. <u>Rejected Nov. 1, 1906</u> | 18. _____ |
| 4. <u>Amended July 1, 1907</u> | 19. _____ |
| 5. <u>Rejected August 16, 1907</u> | 20. _____ |
| 6. <u>Amended August 10, 1908</u> | 21. _____ |
| 7. <u>Rejected Oct. 21, 1908</u> | 22. _____ |
| 8. <u>Amended Sept. 17, 1909</u> | 23. _____ |
| 9. <u>Rejection Oct. 5, 1909</u> | 24. _____ |
| 10. <u>Amended Oct. 3rd, 1910</u> | 25. _____ |
| 11. <u>Office letter Nov. 5, 1910</u> | 26. _____ |
| 12. <u>Partial amendment Nov. 17, 1910</u> | 27. _____ |
| 13. <u>Amended Oct. 31, 1911</u> | 28. _____ |
| 14. <u>Rejected Nov. 17, 1911</u> | 29. _____ |
| 15. <u>Amended Nov. 14, 1912</u> | 30. _____ |

FRANK L. DYER,

Counsel,

Orange, New Jersey.

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS ALVA EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, in the County of Essex and State of
New Jersey,

prays that letters patent may be granted to him for the improvements in

STORAGE BATTERY RECEPTACLES

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Edison Laboratory, Orange, New Jersey, his
attorney, with full power of substitution and revocation, to prosecute this
application, to make alterations and amendments therein, to receive the patent,
and to transact all business in the Patent Office connected therewith.

Thomas A. Edison

201-852-4200 11/29/19 1907

Be it known that I, THOMAS ALVA EDISON, a citizen of the United States and a resident of Llewellyn Park, Orange, in the County of Essex and State of New Jersey, have invented certain new and useful improvements in STORAGE BATTERY RECEPTACLES, of which the following is a description:

This application is a ^{division 11/14/12} ~~division~~ of an applica-
tion filed November 28, 1902, Serial No. 133,112, which has
matured into Letters Patent No 742,112, granted May 1, 1907.

My invention relates to improvements in storage batteries and more particularly to the provision of a battery can or receptacle having an opening through which the solution of active material or water may be introduced from time to time to replenish the battery and means for closing the same tightly against leakage, and capable of being readily opened whenever desired to introduce the solution. With these ends in view my invention consists in the features hereinafter described and claimed.

Reference is hereby made to the accompanying drawing in which Figure 1 is a side elevation partly in section of a storage battery to which my invention is applied, and Figure 2 is a plan view of the same, the section line of Figure 1 being indicated at the line 1-1.

The can 1 is generally rectangular as shown, being formed preferably of thin sheet steel which has been carefully nickel-plated so as to prevent oxidation, particularly in an alkaline solution, but obviously other materials can be used if desired. The top 3 is provided with an upturned flange 4 having a return flange 5 so as to

receive the upper end of the can. After the top has been placed in position solder may be applied to the joint between the bottom of the flange 5 and the upper end of the can so as to make a perfectly tight joint. By employing a top of this character the can is strengthened at its upper end from both expanding and compressing strains, so that the joint will at all times be perfectly air tight. The top 3 is provided with an opening in which a sleeve or bushing 36 is secured by upsetting the metal of the top 3 to form a bead 39 engaging a recess 23 in said sleeve, thus making a very tight, substantial, durable and cheap joint which requires no solder whatever, although it may be used.

Surrounding the sleeve 36 near its upper end is a ring 40 carrying a hinge 41 for a lid 42, the latter having a rubber packing 43 engaging an inclined seat 44 at the mouth of the sleeve 36. The lid 42 is locked normally in position by a yoke 45 pivoted to the ring 40 and the hinge 41 is provided with a coiled spring 46 of common construction, so as to automatically open the lid when the yoke is unlatched. By providing the rubber packing a perfectly tight joint is secured at all times, while by merely unlatching the yoke the lid will be automatically opened to permit of a filling operation.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is as follows:

1.- A storage battery can or receptacle having a filling tube at the top of the can and a lid hinged to said tube, substantially as set forth.

2.- A storage battery can or receptacle having a filling tube at the top of the can, a lid hinged to said

*Corrected
Apparatus
Drawing*

*Witness
affirm*

*40/11
15-4*

2012-09

*Considered by
July 10, 1968*
tube and a spring for opening said lid, substantially as set forth.

*Considered by
July 10, 1968*
3.- A storage battery can or receptacle having a filling tube at the top of the can, a lid hinged to said tube, and a yoke for locking said lid in its closed position, substantially as set forth.

*Considered by
July 10, 1968*
4.- A storage battery can or receptacle having an opening, a bushing or sleeve secured therein and having a valve seat, a pivoted cover valve normally resting upon said seat and means for holding said valve upon said seat, substantially as set forth.

*Considered by
July 10, 1968*
5.- A storage battery can or receptacle having an opening, a bushing or sleeve secured therein and having a valve seat, a pivoted cover valve ^{normally resting upon} *now normally movable* ^{means for holding said valve} upon said seat and means for opening said cover valve when the holding means is released, substantially as set forth.

*Considered by
July 10, 1968*
6.- A storage battery can or receptacle having an opening, a bushing having a valve seat and secured in said opening, a ring applied to said bushing and a cover valve pivoted to said ring, substantially as set forth.

*Considered by
July 10, 1968*
7.- A storage battery can or receptacle having an opening, a bushing having a valve seat and secured in said opening, a ring applied to said bushing, a cover valve pivoted to said ring and a spring for opening said cover valve, substantially as set forth.

8/10/68
2
8.- A storage battery can or receptacle having an opening, a bushing having a valve seat and secured in said opening, a ring applied to said bushing, a cover valve pivoted to said ring, a spring for opening said cover valve and means for holding said valve in a closed position, substantially as set forth.

8/10/68
3. attached to said ring and
coacting with said cover valve.

*Claim 1
Sept 12, 1907*

9.- A storage battery can or receptacle having a filling tube formed with a seat, a hinged lid having a yielding packing for engaging said seat and means for holding said lid in a closed position, substantially as set forth.

*Claim 2
Sept 12, 1907*

10.- A storage battery can or receptacle having a filling tube provided with an inclined seat, a hinged lid having a yielding packing for engaging said seat, and means for holding said lid in a closed position, substantially as set forth.

*Insert "A" claim 1
July 1, 1907*

*Insert "B" claim 4
Aug 10, 1908*

Insert "C" Claim 5 & 6 Nov 1

Insert D. Claims 1, 2 & 3 - 11/1/12

This specification signed and witnessed this 6 day of December 1905

Thomas A. Edison

Witnesses:

1. Frank L. Dyer

2. Anna R. Kohn

Oath.

State of New Jersey }
County of Essex } ss.,

THOMAS ALVA EDISON, the above named
petitioner, being duly sworn, deposes and says that he is a citizen of the United
States, and a resident of Llewellyn Park, Orange, in the County of
Essex and State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the
improvements in

STORAGE BATTERY RECEPTACLE

described and claimed in the annexed specification; that he does not know and
does not believe that the same was ever known or used before his invention or
discovery thereof; or patented or described in any printed publication in the
United States of America or any foreign country before his invention or
discovery thereof, or more than two years prior to this application; or patented
in any country foreign to the United States on an application filed more than
twelve months prior to this application; or in public use or on sale in the
United States for more than two years prior to this application; and that no
application for patent upon said invention has been filed by him or his legal
representatives or assigns in any foreign country.

Sworn to and subscribed before me this 6 day of December 1905

Thomas A. Edison
Frank L. Dyer

[Seal]

Notary Public.

211

211

Standard 7 ref.

Fig. 1.

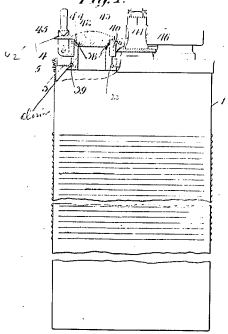
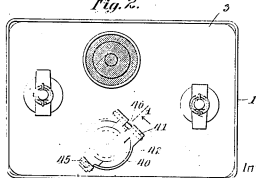


Fig. 2.



Attest:
Edgar A. Gurnea
Notary Public

Inventor:
Thomas W. Gurnea
Atty:

by Thomas W. Gurnea
Atty:

Div. 320m 148
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-260.
FEB

Paper No. 1
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

T. A. Edison,

WASHINGTON, D. C.,

May 4, 1906.

C/o F. L. Dyer,

Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application,
No. 290,712, filed Dec. 7, 1905, "Storage Battery Receptacles".

R. I. Allin
Commissioner of Patents.

Claims 1, 4, and 9 are rejected on each of the patents to:

Coffin, 193,321, July 24, 1877 (C.C., Fasteners, Bar).
Dundon, 418,867, Jan. 7, 1890 (Tank Clo.).
Snyder, 124,768, Mar. 19, 1872 (Same class).

Claims 2 and 5 are rejected on the patent to:

Rider, 125,220, Apr. 2, 1872 (Barrels, Bungs).

Claim 3 is rejected on the patent to:

Lloyd, 750,470, Jan. 26, 1904 (Tank Clo.).

Claim 6 is rejected on the patent to Coffin, supra.

Claims 7 and 8 are rejected on the patent to Coffin, taken with
the patent to Rider, supra.

Claim 10 is rejected on each of the patents to Snyder, Dundon
and Coffin, all of record, taken with the valve seat feature shown
in the patent to:

McNairy, 609,239, Aug. 16, 1898 (C.C., Pas., Bar).

UNITED STATES PATENT OFFICE

Thomas A. Edison)
:)
STORAGE BATTERY RECEPTACLES) Room No. 146
:)
Filed December 7, 1905)
:)
Serial No. 290,712)

HONORABLE COMMISSIONER OF PATENTS

S I R : - -

Replying to Office action
of May 4, 1906, please amend the above entitled case as
follows:

Cancel claims 1, 3, 4, 9 and 10.

Claim 2, line 2, change "a" to - an outwardly
movable -.

Claim 5, line 3, cancel "cover valve normally
resting" and insert in place thereof - outwardly movable
cover valve, means for holding said valve -.

Renumber the claims.

- R E M A R K S -

Claims 1 and 2 clearly distinguish from the refer-
ence in that they specify an outwardly movable lid or
cover valve. In the reference the lid moves inwardly.
Furthermore the spring in the reference is for the purpose
of moving the valve B into closed position, whereas in
applicant's device the spring is for opening the valve.

It is obvious that in the claimed structures the
valve can be very readily opened, such being its normal
position, whereas in the reference the valve is difficult

to open and is normally closed so that it is necessary to hold the same open in some manner when it is desired to introduce liquid into the receptacle.

Claims 3, 4 and 5 specify a bushing having a valve seat, a ring applied to said bushing and a cover valve pivoted to said ring. This specific structure is not found in any of the references and it is believed that claims covering the same should be allowed since it provides a very simple and useful device for the purposes set forth.

Respectfully submitted,

THOMAS A. EDISON

By Francis L. Oyes
his attorney

Orange, New Jersey

September 12 1906.

2-200.

Div. 32. Room 148
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

Paper No. 3
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

III

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

November 8, 1906.

Thomas A. Edison,
c/o Frank L. Dyer,
Edison Laboratory,
Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application,
S. No. 290,712, filed Dec. 7, 1905, Storage Battery Receptacles.

H. I. Allen
Commissioner of Patents.

This action is in response to amendment filed Sept. 13,
1906.

Claims 1 and 2 are rejected on the patent to
Snyder, 148,095, Moh. 3, 1874, (Tank Attachments),
taken with the patent to

Epstein, 557,267, Sept. 14, 1900, (B.C. Hinges Spring).

This patent to Snyder is cited in lieu of the Snyder
patent, 124,768, as this patent shows more clearly the structure
claimed. It is old and common to use springs for both throwing
the cover open and to keep it closed. The mere addition of a
spring to an old form of ~~spring~~ closure is not deemed to be a
matter of invention.

Claims 3, 4 and 5 remain under the rejection of record.
They are also rejected on the patent to

Oppl, 527,123, Oct. 9, 1884, (Tanks, Transporting Vehicles)
taken with the patent to Epstein, of record.

UNITED STATES PATENT OFFICE.

Thomas A. Edison)
STORAGE BATTERY RECEPTACLES)
Filed December 7, 1905) Room No. 148
Serial No. 290,712)

HONORABLE COMMISSIONER OF PATENTS:

S I R : -

Replying to Office letter of November
8, 1906, please amend the above entitled case as follows:

Cancel claim 1.

Renumber claims 2, 3, 4 and 5 as 1, 2, 3 and 4.

Add the following, as claim 5:

2
amplified
~~3~~ 5. A storage battery can or receptacle having an
opening in its top, a bushing having a valve seat and secur-
ed in said opening, a ring applied to the exterior of said
bushing, a cover valve pivoted to said ring, a spring
for opening said cover valve and means, on said ring for
holding said valve in a closed position, substantially as
set forth. - *See amendment D. B. Edwards 1283*
11/14/12

- R E M A R K S -

The claims in this case have been rejected upon
a number of patents, concerning which the most that can
be said is that they disclose in various relations the
greater part of the elements which make up applicant's
device. But no one of these patents or any combination
thereof, would suggest the device of this application

It is believed that the claims as presented are allowable over the art as stated and allowance is respectfully requested.

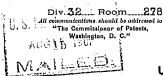
THOMAS A. EDISON

By

Frank Dyer
His Attorney.

Orange, New Jersey

July 1st 1907.



211 2-260.

Paper No. 5.....
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

EO
DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., August 15, 1907.

Thomas A. Edison,
C/o Frank L. Dyer,
Edison Laboratory, Orange, N. J.

Please find below a communication from the EXAMINER in charge of your application,
for "Storage Battery Receptacles", filed Dec. 7, 1905, Serial
No. 290,712.

E. B. Moore

Commissioner of Patents.

This action is in response to amendment filed July 2, 1907.
Claims 1, 2, 3 and 4 remain under the rejection of record.
New claim 5 is rejected on the references of record.

UNITED STATES PATENT OFFICE.

Thomas A. Edison

STORAGE BATTERY RECEPTACLES

Filed December 7, 1908

Serial No. 290,712

Room No. 148

HONORABLE COMMISSIONER OF PATENTS:

SIR: - -

In response to Office
action of August 18, 1907, please amend the above entitled
case as follows:

Cancel Claims 1, 2 and 3, and substitute the
following as Claim 1:

See amend D-Claims 1 & 2 & 3 - 11/17/09
A storage battery can or receptacle having an
opening, a bushing having a valve seat and secured in
said opening, a ring applied to said bushing, a cover
valve pivoted to said ring, and a latching means pivoted
to said ring, and co-acting with an extension of said
cover valve, substantially set forth.

Renumber Claim 4 as Claim 2, and after "position"
in line 5, insert - comprising a locking means attached to
said ring, and co-acting with said cover valve - .

Renumber Claim 5 as Claim 3. Line 5 of said
Claim, after "means" insert - pivoted - .

Add the following claim:

*Amended
11/17/09*
(4) A can or receptacle having an opening in its
top, and having the metal forming the edge of said opening

Amended

bent into a bead, a bushing provided with a circumferential recess engaged by said bead to secure said bushing in place in said opening, and a lid hinged to said bushing, substantially as set forth.

- R E M A R K S -

The claims have been amended in view of the references, and in their present condition, are thought to be allowable. New Claim 4 is also thought to be allowable, since none of the references disclose the method of mounting the bushing here claimed.

Respectfully submitted,

THOMAS A. EDISON

By *Frank L. Dyer*

His Attorney.

August 10, 1908.

211

2-260.

Div. 32 Room 278
U. S. 113 Washington, D. C.
SEP 21 1908
MAILED.

Paper No. 7

All communications respecting this application should give the serial number, date of filing, and title of invention.

HO

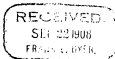
DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.

Sept. 21, 1908.

Thomas A. Edison,

C/o Frank L. Dyer,

Edison Laboratory, Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application, for "Storage Battery Receptacles", filed Dec. 7, 1905, Serial No. 290,712.

E. B. Moore
Commissioner of Patents.

Response to amendment filed Aug. 11, 1908.

New claim 1 is rejected on the references of record.

Claims 2 and 3, as amended, are rejected on the references of record.

Claim 4 is rejected on the patent to Shepherd, 351,660, Oct. 26, 1886, (Casks), taken with the patent to Snyder, 148,095, of record.

hewins

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)

STORAGE BATTERY RECEPTACLES)

Filed December 7, 1905)

Serial No. 290,712)

Room No. 148

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to Office action of
September 21, 1908, please amend as follows:

Cancel Claim 4 and rewrite as follows:

4. ^{any added to Claim 4 - 11/14/12 - Reconsideration - 5}
A storage battery can or receptacle having an
opening and having the metal forming the edge of said
opening bent into a bead, a bushing having a valve seat
and provided with a circumferential recess engaged by
said bead to secure said bushing in place in said opening,
a ring applied to said bushing, ^{and} a cover valve pivoted to
said ring and mounted upon said valve seat, ~~a spring for~~
~~opening said cover valve, and means for holding said valve~~
~~in a closed position, comprising a latching means attached~~
~~to said ring and co-acting with said cover valve, sub-~~
~~stantially as set forth.~~

R E M A R K S

The claims are thought to differ specifically
and patentably from the references and reconsideration
and allowance are respectfully requested. None of the

references discloses the construction of a bushing having a ring applied thereto, a valve pivoted to the ring, and latching means also pivoted to the ring and co-acting with the cover. This construction is claimed in Claims 1, 2 and 3. Claim 4 submitted by applicant's last amendment was not met in the references, in that they did not show a receptacle having an opening, the metal forming the edge of which was bent into a bead. This claim has, however, been rewritten to include a number of other limitations and is undoubtedly patentable. If the Examiner should still be of the opinion that Claims 1, 2 and 3 are met in the references of record, he is requested to apply the same to the claims. The construction of the ring having the valve and latching means pivoted thereto is thought to be novel, simple and efficient.

Respectfully submitted.

THOMAS A. EDISON

By Frank L. Oyer
His Attorney

Orange, New Jersey

September 17, 1909.

211

Div. 4 Room 280

2-280.

JWT

Paper No. 9

ADDRESSEE ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

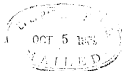
WASHINGTON, D. C.,

October 5, 1909.

Thomas A. Edison,

c/o Frank L. Dyer,

Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

290,712 filed Dec. 7, 1905 for Storage Battery Receptacles.

E. B. Moore

Commissioner of Patents.

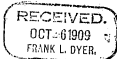
This is in response to amendment of Sept. 18, 1909.

In claim 1 "extension" has no antecedent.

Claim 4 is rejected as an aggregation, there being no coordination between the specific bead and groove means of securing the bushing in the opening and applicant's specific style of cover valve closure.

The other claims may probably be allowed.

Examiner.



Confield

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison :

STORAGE BATTERY RECEPTACLES :

Room No. 148.

Filed December 7, 1905 :

Serial No. 290,712 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of October 5, 1909, please amend this case as follows:

Page 1 of the specification, line 8, insert at the end of the line - which has matured into Letters Patent No. 852,424, granted May 7, 1907 - .

Cancel Claim 1 and rewrite as follows: -

Cancel 11/10 - see insert D
1. A storage battery can or receptacle having an opening, a bushing having a valve seat and secured in said opening, a ring applied to said bushing, a cover valve pivoted to said ring and having an extension, and a latching means pivoted to said ring and coacting with said extension of said cover valve, substantially as set forth. - *with a cover valve* *the cover valve*

Claim 4, line 6, insert - and - after "bushing".
Line 7, cancel "a spring for". Cancel all of lines 8 and 9 and cancel line 10 through "valve".

R E M A R K S

Reconsideration and allowance are requested.

Claim 1 has been rewritten to overcome the formal objection of the Examiner that the term "extension" had no antecedent. Certain elements of the combination in Claim 4 have been canceled in order to remove any possible objection that the claim is an aggregation therefrom. It is thought that the claim in its present form is patentable over the references.

Respectfully submitted,

THOMAS A. EDISON

By _____

His Attorney

Oct. 3rd, 1910.

Div. 4 Room 280

2-260

LWT

Paper No. 11

Address only
The Commissioner of Patents,
Washington, D. C.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

November 5, 1910.

Thomas A. Edison,

c/o Frank L. Dyer,

Orange, N. J.

Please find below a communication from the EXAMINER in charge of your application.

298,712 filed Dec. 7, 1905 for Storage Battery Receptacles.

E. B. Moore

Commissioner of Patents.

Responsive to amendment of October 4, 1910.

The oath in this case is informal according to Rules of Practice, #47, which forbids the acknowledgment being taken by any attorney appearing in the case. A new oath is required.

The claims are thought to contain nothing patentable over the art of record, in view of the use of a separate ring on which to mount the cover and locking bar as illustrated by the following patents:-

McCormick, et al, 554,344, Feb. 11, 1896, (137-4)
Linich, 608,613, Aug. 9, 1898, (137-28)
Levis, 536,785, Oct. 2, 1894, (Vulcanizing Apparatus)

To so modify the closures shown by ^{the} Snyder patents of record would not be invention. The use of a spring has been shown as old and might be added without involving inventive skill.

Claim 4 is still rejected as an aggregation, as there is no coaction whatever between the closure mounted on a ring and the specific head and recess engagement for securing the bushing to the receptacle. Reckendorfer vs. Faber, C. D. 1876, vol. 10, p. 71.

Info cited

Examiner.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison :
STORAGE BATTERY RECEPTACLES : Room No. 148
Filed December 7, 1905 :
Serial No. 290,712 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In partial response to Office action of November 5, 1910, a new oath is enclosed herewith to be filed in the case to take the place of the oath which the Examiner declares to be informal. An amendment in response to the Examiner's action upon the claims will later be made.

Respectfully,

THOMAS A. EDISON

By _____

His Attorney

Orange, N. J.

November 17th, 1910

O A T H

State of New Jersey)
) ss.:
County of Essex)

THOMAS ALVA EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Orange, in the County of Essex and State of New Jersey; that he verily believes himself to be the original, first and sole inventor of the improvements in STORAGE BATTERY RECEPTACLES described and claimed in the specification of application Serial No. 290,712, filed December 7, 1905; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to said application; or patented in any country foreign to the United States on an application filed more than twelve months prior to the said application; or in public use or on sale in the United States for more than two years prior to said application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Thos. A. Edison

Sworn to and subscribed before me
this 17th day of Nov. , 1910.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)
STORAGE BATTERY RECEPTACLES)
Filed December 7, 1905) Room No. 148.
Serial No. 290,712)

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office action of November 5, 1910, please amend the above entitled application as follows:-

Page 2, line 18, after "yoke" insert - or latch -
Same page, line 19, cancel "and", and insert a period after "40". After the period thus inserted insert as a complete sentence - The lid 42 has an extension 42' with a cam surface for co-operation with the latch 45. - . Same line, change "the" before "hinge" to - The - .

Add the following claims:-

Cancelled 11/14/12
5. A storage battery can or receptacle having an opening, a bushing having a valve seat and secured in said opening, a ring applied to said bushing, a cover valve pivoted to said ring and having an extension with a cam surface, and a latching means pivoted to said ring and coacting with the cam surface of the extension of the cover valve, substantially as set forth.

6. A storage battery can or receptacle having an opening, a bushing having a valve seat and secured in said

opening, a ring applied to said bushing, a cover valve pivoted to said ring and having an extension with a cam surface, a spring tending to move the cover valve to open position, and a latching means pivoted to said ring and adapted to coact with the cam surface of the extension of the cover valve to hold the said cover valve closed, substantially as described.

R E M A R K S

The Examiner is requested to apply the reference character 42' to the extension with a cam surface of the lid 42 in Figure 1.

Reconsideration of the rejection of Claims 1 to 4 inclusive is requested. In the rejection of these claims the Examiner apparently relies principally upon the Snyder patents taken with the patents to McCormick et al., Linich, and Lewis. The Snyder patents show man-hole covers for oil tanks and do not show structures which it is believed would be suitable for use on battery cans. The locking means shown in Snyder is complicated, and the whole apparatus is of a character applicable to large and heavy structures. These patents do not show springs for opening the covers, and there is nothing in them to suggest the use of springs for this purpose. In fact, none of the references of record shows the use of a spring for opening the cover in apparatus similar to that disclosed by applicant. The patent to Linich shows a pipe joint and connection, and also means for closing or sealing the end of the pipe. It is not believed that this patent has any bearing on applicant's invention. The patent to McCormick et al. shows a clean-

out valve having a rather complicated closing and securing mechanism for the cover which is very different from that disclosed and claimed by applicant. The patent to Lewis shows a cover for a dental vulcanizer and means for holding the same in closed position. In this patent, the cover is not hinged and is entirely separate and distinct from the mechanism for holding it closed.

Applicant has invented a storage battery can provided with a simple and efficient device capable of being easily opened for filling the can and of being easily and securely closed after the can has been filled. None of the references shows a storage battery can or receptacle provided with such a device.

New Claims 5 and 6 are believed to be patentable over the references of record for the reasons stated above, and because of the additional limitation of the cam surface upon the extension of the cover valve.

Reconsideration of the rejection of Claim 4 as an aggregation is requested. The claim covers a unitary structure, and the bead and recess engagement for securing the bushing to the receptacle is of particular utility in a structure of the character described. All of the elements recited co-operate in the structure, and the case is not believed to be parallel to that of the lead pencil provided with an eraser passed upon in *Reckendorfer v. Faber* cited by the Examiner. In this case two instruments were provided with a common handle, and when one of the instruments was in use, the other was out of use. Such is not the case in applicant's structure.

If the Examiner should reject any of these claims again, he is requested to indicate just which of the many references cited in the record he relies upon as anticipating each rejected claim.

Reconsideration and allowance are requested.

Respectfully submitted,

THOMAS A. EDISON

By Frank L. Dyer

His Attorney

Orange, New Jersey

October 31, 1911.

Div. 40 Room 280

2-200

LWJ

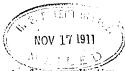
Paper No. 14

Address only
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

211
DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

Thomas A. Edison, WASHINGTON November 17, 1911.
c/o Frank L. Dyer,
Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

290,712, filed Dec. 7, 1905 for Storage Battery receptacles.

E. B. Moore

Commissioner of Patents

Responsive to amendment of Nov. 1, 1911.

Claims 1 to 4 are rejected on the references and for the reasons of record.

Claims 5 and 6 are rejected on the art of record in view of the latch operating over a cam surface of an extending bar in the patent to

Munger, 430,349, June 17, 1890, (220-61)

It is thought that applicant has merely aggregated several old elements in a single closure, without attaining any substantive improvement over the present art. It has been shown as old to mount a bushing in a tank opening, this bushing having a closure seat. The art also shows a ring mounted on a member to be closed, the ring carrying a hinged closure on one side and a pivoted latch member on the opposite side. There is also shown a substantial equivalent of applicant's means for securing the bushing to the tank opening, as already pointed out; and the combination of cam surface and latch is shown in the above-cited patent.

Although the closures of record include a bar member that is pivoted directly to the bushing, and that carries the cover member, yet the claims do not distinguish from this structure in which the covers can be said to be pivoted to the ring or studs, indirectly. Moreover, the idea of pivoting the cover directly to the ring or

290,712. #2.

studs is shown to be old in Coffin and Ryder and others of record; and also by the patents to:

o = Davies, (Br.) 12,445, of 1898, (220-124)
o = Nokel, (Ger.) 41,601.

As further illustrating the cam engagement for the closure,

see the patents to:

o = Davis, 251,420, rec. 27, 1881, (220-61)
Rock, 398,539, Feb. 26, 1889, " "

The claims are rejected as aggregations of old elements.

The claims are further rejected as aggregations of unrelated elements, as pointed out; each particular element performing its function independently of the others.

Examiner.

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
STORAGE BATTERY RECEPTACLES,)
Filed December 7, 1906.) Room No. 148.
Serial No. 290,712.)

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office action of November 17, 1911, please amend the above entitled case as follows:

Page 1, line 8, correct the spelling of "division".

Cancel the present claims and insert the following claims in place thereof:

1. A storage battery can or receptacle having an opening, a bushing (device) having a valve seat and secured to the walls of said opening by a fluid tight joint, a cover valve pivoted directly to said bushing device and having a cam surface formed thereon and a member pivoted directly to said bushing device and coacting directly with the cam surface of the cover valve to force the latter into fluid tight engagement with said valve seat, substantially as described.

2. A storage battery can or receptacle having an opening, a bushing (device) having a valve seat and secured to the walls of said opening by a fluid tight joint, a cover valve pivoted directly to said bushing device and having a cam surface formed thereon, spring means normally tending to open said cover valve, and a member pivoted directly to said bushing device and coacting directly with the cam

surface of the cover valve to force the latter against the tendency of said spring means into fluid tight engagement with said valve seat, substantially as described.

2
600. 3. A storage battery can or receptacle having a filling opening, a bushing having a valve seat and secured to the walls of said opening by a fluid tight joint, a ring applied to said bushing, a cover valve pivoted directly to said ring and having an integral extension opposite its pivotal connection with said ring, said extension having a cam surface formed on the top thereof, a spring normally tending to open said cover valve, ^{and} a latch pivoted directly to said ring and coacting with the cam surface on said extension of the cover valve to force the latter against the tendency of said spring into fluid tight engagement with said valve seat, substantially as described.

R E M A R K S

The new claims presented herewith are drawn specifically to applicant's device and are believed to patentably distinguish from the references of record. None of these references discloses the combination of a bushing secured within the opening of a receptacle by a fluid tight joint, a cover valve pivoted directly to the bushing and having a cam surface formed thereon and a member pivoted directly to said bushing and coacting directly with the cam surface of the cover valve to force the latter into fluid tight engagement with the valve seat formed on the bushing as set forth in claim 1. In none of the structures disclosed by Munger, Davis, Rock and German patent to Nokol is the cover pivotally mounted and in none of these devices is a cam surface formed directly on the cover with

which a pivoted member directly coacts to force the cover into fluid tight engagement with its seat. In Munger the cam surface is formed on a lever B separate from cover F and a pivoted yoke E is forced into engagement with the cam surface by means of a screw rod D to force lever B and thereby cover F downwardly. In Davis' device, cover A is placed on the upper edge B of the vessel, bar E is then placed on the cover with its ends passing through the ears D and the cover is then pressed down tightly on the edge B by driving a wedge F between one of the ears D and the top of bar E. In Roek's apparatus, in order to seal the vessel A, cover E, which has no fixed connection with the vessel, is placed on the top thereof and loops B pivotally connected to the vessel are then turned so as to take over the ends of a bar or cleat F fastened to the cover. It is then necessary to turn lever D toward the center of the cover E to force the cam portion thereof into engagement with the bar F. In the device disclosed by Nokol, a plurality of screw bolts a pivoted at g, to an annular flange surrounding an opening co-operate with a plurality of slots e' formed in a cover adapted to close the opening to hold the cover in place. Co-operating with each of the screw bolts is a spring pressed lever d having cam surfaces f with which the bolts engage when forced into the slots g' to turn the levers about their pivots against the tension of the springs g. When the screw bolts reach the end of the slots g', springs g act to force the levers d into locking engagement with the screw bolts, slots l being provided in the levers to receive the bolts. In the English patent to Davies, cover E' is not pivoted directly to ring B in the form shown in Figs. 3 and 4 nor to the plate A in the device shown in Figs. 5 and 6. Moreover,

the means for pressing cover E of Davies tightly against its seat comprises a pivoted bolt adapted to be received in a slot provided in the cover and a thumb screw G on the bolt. It is obvious that none of the numerous references cited in the actions preceding the Office action of November 17, 1911, discloses ^{the} combination of elements recited in claim 1, and it is believed to be ^{un}necessary to consider these references in detail as they have been previously discussed. Claim 2 further distinguishes from the cited art by specifying spring means normally tending to open the cover valve. Claim 3 is drawn along the lines of claim 2 in somewhat narrower terms.

It is submitted that the claims now presented do not cover aggregations, but are drawn to true and patentable combinations. By the combinations set forth in the claims, a new and useful result is accomplished, namely, the assurance of the hermetical sealing of the aperture in a battery can when certain of the elements are in one position, and the opening of said aperture when these elements are in another position. Practically all of the claims of the numerous patents cited describe combinations of old elements and the claims in this application, it is submitted, are no more aggregations than are the claims of these patents. It may be true that all of the elements of the combinations described in the present claims are old, but the combinations themselves are not old, in view of the disclosures of any of the references of record. There are numerous decisions, ^{the} as Examiner is doubtless aware, holding that a new combination of old elements is patentable when the several elements produce either a new and useful result, or an old result in a

more facile, cheaper or otherwise advantageous way.

For the above reasons, further consideration and allowance of the claims now presented are requested.

Respectfully submitted,

THOMAS A. EDISON,

By Frank L. Davis
his Attorney.

Orange, New Jersey,

November 14, 1912.

Div. 40 Room 380.

Address only
"The Commissioner of Patents,
Washington, D. C."

2-200 MCH / AS

Paper No. 16

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

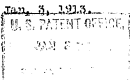
WASHINGTON

Thomas A. Edison,

c/o Frank L. Dyer,

Edison Laboratory,

Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

#290,712, filed Dec. 7, 1905, for Storage Battery Receptacles.

6-5631

E. B. Moore

Commissioner of Patents.

Responsive to amendment filed Nov. 15, 1912.

The claims are each confusing in their reference to the "bushing device", since it is not clear just what element applicant refers to by this term.

The claims are each incorrect in the statement that the cover has a cam surface. There is no cam action between the cover valve and the fastening member; the fastening member moves on a pivot and its free end describes the arc of a circle, while the extension of the cover valve has its free end rounded so that the fastening member will ride up over it in its movement; such a coaction does not constitute cam means.

The claims are each again rejected on the references for the reasons of record.

The claims are also rejected on

736,772, Aug. 18, 1903, Petersen (220 - 124).

It is not believed that anything patentable has been disclosed in this case, and applicant is advised to prepare for final action.

Examiner.

Folio No. 212
DIVISION OF FOLIO 22.

Serial No. 290711

Applicant.

Address.

Thomas A. Edison

Title Storage Batteries

Filed December 7, 1905

Examiner's Room No. 75

Assignee Edison Storage Battery Co.

Ass't Exec. Edison Recorded Oct 2, 1908 Liber 680 Page 87

Patent No. 914,342 Issued Mar. 2, 1909

ACTIONS.

- 1 Rejected June 17, 1906 16
- 2 Request for reconsideration 17
- 3 Rejection Oct. 2nd 1906 18
- 4 Amended June 26, 1907 19
- 5 Rejection August 5, 1907 20
- 6 Amended July 31, 1908 21
- 7 Allowance Aug 24, 1908 22
- 8 Final fee paid Aug 24, 1908 23
- 9 Final fee paid Feb. 2, 1909 24
- 10 25
- 11 26
- 12 27
- 13 28
- 14 29
- 15 30

FRANK L. DYER,

Counsel,

Orange, New Jersey.

F 212 - 290711

Divg F 22

(Means for stringing & spacing the plates)

P1 -

Place 36 windings

Cancel clms 1, 2, 3, 4,

Means for clamping said plates and separating by other,

In a st bat, the combination of a series of plates of one polarity, a bolt on which said plates are strung, a series of plates of the opposite polarity, a bolt on which said second named plates are strung parallel to said first named bolt. Conducting separators strung on said bolts between plates of like polarity and non-conducting separators between all the plates for insulating plates of opposite polarity from each other. Subst as a first

2 - the combination of a series of plates carrying pockets containing active material and insulating means situated between the plates and the pockets, each said means ^{arranged to} preventing contact between adjacent plates and pockets subst as a first.

3 - and insulating means situated in the channels between adjacent pockets and adjacent plates, arranged to prevent for preventing contact between elements of opposite polarity over

[ON BACK OF PRECEDING PAGE]

4 The combining of a series of plates of one polarity, a series of plates of the opp. polarity ^{positive} ^{negative} for plating one series alternating with those of the other, all of the plates carrying protective or porous filler with other material means for elastic and conductive clamping together ^{any} plates of the same polarity, and means for insulating the plates and protecting and unlike polarity from each other. Subject as set forth -

212

~~Cancel cl 1-5 + pass case to
winc~~

Amend

Out 2

Folio No. 217Serial No. 295,472

Applicant.

Thos. A. Edison

Address.

Orange New Jersey

Title

Primary and Secondary Batteries

Filed

Jan. 10, 1906

Examiner's Room No. _____

Assignee

Edison Manufacturing Company.

Ass'g't Exec.

15 May 07 Recorded June 1, 1907 Liber. 76 Page 346Patent No. 558,862

Issued

July 2, 1907

ACTIONS.

- | | | | |
|----|-------------------------------------|----|-------|
| 1 | <u>Rejected Oct. 21, 1906</u> | 16 | _____ |
| 2 | <u>Amended Feb. 7, 1907</u> | 17 | _____ |
| 3 | <u>Allowed March 19, 1907</u> | 18 | _____ |
| 4 | <u>Final fee due Sept. 19, 1907</u> | 19 | _____ |
| 5 | <u>Final fee paid June 2, 1908</u> | 20 | _____ |
| 6 | _____ | 21 | _____ |
| 7 | _____ | 22 | _____ |
| 8 | _____ | 23 | _____ |
| 9 | _____ | 24 | _____ |
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| 12 | _____ | 27 | _____ |
| 13 | _____ | 28 | _____ |
| 14 | _____ | 29 | _____ |
| 15 | _____ | 30 | _____ |

FRANK L. DYER,

Counsel,

Orange, New Jersey.

Received Jan 4/06
S. L. D.

Dyn. patent

Jan 3rd 1906

Improvements in Alkaline ~~Cells~~
batteries of the Leclanche Type -

The invention consists in the use of an alkali like Potassium Hydroxide for the electrolyte with Silicate of Potash added thereto. The solvent power of the solution ~~is~~ for Zinc is ~~increased~~ is more than doubled, thus allowing of a much smaller cell to obtain a given ampere capacity ~~than~~ The best proportion in cells where Zinc & Copper Oxide is used is — a 20%

Solution of Potassic hydrate to which ~~10~~ % of Silicate of Potash is added — in other words to 100 Cubic Centimeters of Water there is contained 20 grammes of solid hydrate of Potash & 15 grammes of ~~solid~~ ^{anhydrous} ~~hydrated~~ Silicate of Potash, = Where the solution is used for a reversible battery employing for instance Nickel hydroxide for one pole & Zinc for the other pole the amount

of Palash & Silicate can be increased
as there is not the same liability to
freeze as with the primary cell using
Copper & Zinc as these are generally
used in exposed places in the winter.
The action of the silicate is not well
understood possibly it forms a
Silicozincate of Potash which is
more soluble than the Zincate of
Potash —

1st patent.

Claim as an Electrolyte for galvanic battery
a caustic alkali containing ~~silicate~~
~~silicate~~ an alkaline silicate.

2nd pat Nickel-Zinc Reversible storage
battery having in electrolyte
of ~~concentrated~~ ~~alkali~~ an alkali
in which is dissolved an alkaline
silicate.

3rd patent Copper-Zinc Battery containing
same electrolyte —

KSil- in KOH, OK ¹¹⁷ best

NaSil ^{not} " " OK

NaSil " NaOH, ug helps ^{helps} ~~helps~~

NaSil ~~break~~ in NaOH, ug "

-SPECIFICATION-

TO ALL WHOM IT MAY CONCERN:

Be it known that I, THOMAS ALVA EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, in the County of Essex and State of New Jersey, have invented certain new and useful improvements in PRIMARY AND SECONDARY BATTERIES, of which the following is a description:

My invention relates to primary and secondary batteries of the type employing ^{an} alkaline electrolyte and wherein one of the active materials during the discharge is dissolved in the electrolyte, a suitable depolarizing material being used furnishing oxygen on discharge.

An example of a primary battery of this type is the well known Lalande element wherein ~~the~~ metallic zinc is opposed to oxide of copper in a potassium hydrate solution, the zinc on discharge being dissolved in the electrolyte to form an alkaline zincate, and the copper oxide being reduced to the metallic state.

An example of a secondary or reversible battery of this type is described in my patent No. 684,205, dated October 8, 1901, wherein nickel hydroxide is used as the depolarizer, a plate of metallic magnesium being employed to receive the zinc deposit plated out of the alkaline zincate solution by the charging current. With such a secondary battery, on discharge the nickel hydroxide will be reduced to a lower condition of oxidation, and the metallic zinc will be oxidized and dissolved in the electrolyte from which it will be again plated out on the next charging operation.

My present invention is based on the discovery that if an alkaline silicate, preferably silicate of potash, is added to the electrolyte of batteries of the type referred to, the solvent power or capacity of the solution for zinc is very largely increased and may be made actually more than twice that of the usual alkaline hydrate alone. This permits the battery cells to be made considerably smaller than heretofore in order to obtain a given ampere capacity.

In the case of the Lalande combination, using copper oxide opposed to metallic zinc, the best composition for the electrolyte is to add to a twenty percent solution of potassic hydrate, about fifteen per cent of silicate of potash. In other words, each one hundred cubic centimeters of the solution contains twenty grams of solid hydrate of potash, to which is added fifteen grams of powdered silicate of potash; but it will be of course understood that the proportion of ingredients used may be varied within wide limits, and, in fact, that the addition of even a small percentage of silicate of potash adds to the useful effect.

When the solution is used in connection with reversible or secondary batteries employing nickel hydroxide opposed to metallic zinc, as described in my patent above referred to, the proportions of potash and of the alkaline silicate can be conveniently increased, since there is less likelihood of the solution freezing than with a primary battery, which latter are ordinarily used in more exposed places, such as for railroad signaling. The employment of the new electrolyte in connection with an alkaline silicate reversible battery, *reduces the weight of each cell* is commercially *of the highest value, since it enables me to reduce the bulk of the battery considerably*

of the electrolyte to such an extent as to compare favorably with the ordinary Edison batteries employing nickel and iron active masses.

It will of course be understood that the improved electrolyte may be used in any alkaline zincate battery, either primary or secondary, and that any suitable active depolarizing material may be employed, such as oxides of copper, silver or mercury or the hydroxides of nickel or cobalt.

I am not able to explain with absolute certainty the cause of the very superior results which are secured when an alkaline silicate is added to the solution as above explained, but I believe the results are due to the fact that the oxide of zinc formed on discharge is converted into a double salt of silica and potassium (or ^{or a silicate of zinc is formed which} silico-zincate of potash) which is much more soluble in the alkaline solution than the single salt of zinc and potassium, and consequently less of the electrolyte may be used to hold the dissolved metal in solution.

I have referred particularly to the use of silicate of potash as the preferable alkaline silicate for the purpose, since I have secured the best results with this material when added to a solution of potassium hydrate as explained. Very good results may be secured however with silicate of soda in a potash solution, although not quite so good as with silicate of potash. In solutions of soda, the addition of an alkaline silicate results in ^{very little} ~~some~~ improvement, but to a much less extent than when employed in connection with potassium solutions.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is as follows:

1. An alkaline battery electrolyte containing an alkaline silicate, as set forth.

2. An alkaline battery electrolyte containing silicate of potash, as set forth.

3. A battery electrolyte containing potassium hydrate and an alkaline silicate, as set forth.

4. A battery electrolyte containing potassium hydrate and potassium silicate, as set forth.

5. In a battery the combination of an electrode employing metallic zinc, a second electrode employing a depolarizing mass, and an alkaline electrolyte containing an alkaline silicate, substantially as set forth.

6. In a battery, the combination of an electrode employing metallic zinc, a second electrode employing a depolarizing mass, and an alkaline electrolyte containing silicate of potash, substantially as set forth.

7. In a reversible battery, the combination of an electrode employing metallic zinc, a second electrode employing nickel hydroxide as a depolarizer, and an alkaline electrolyte containing an alkaline silicate, substantially as set forth.

8. In a reversible battery, the combination of an electrode employing metallic zinc, a second electrode employing nickel hydroxide as the depolarizer, and an alkaline electrolyte containing silicate of potash, substantially as set forth.

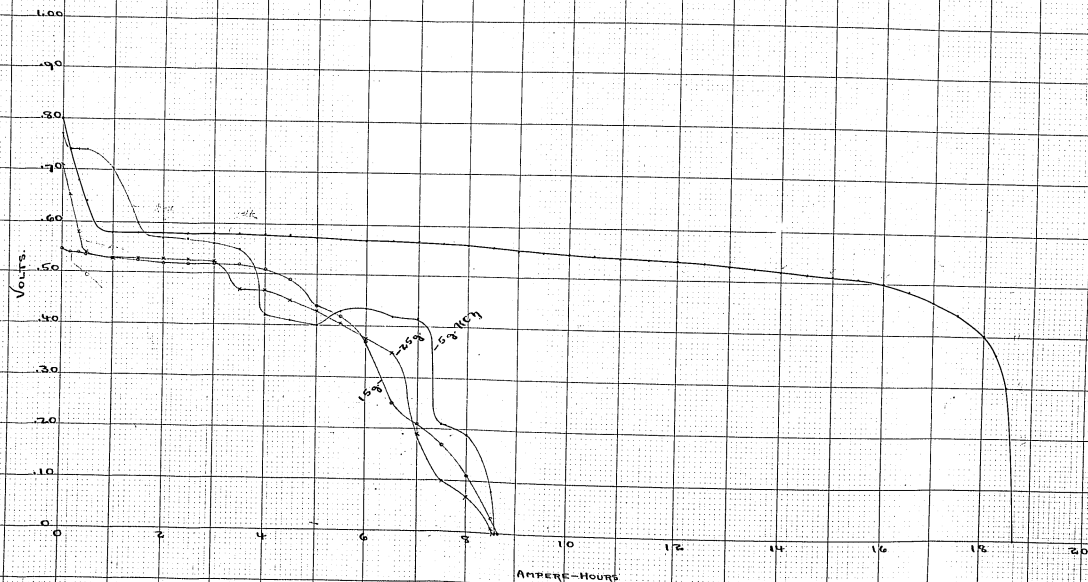
9. In a reversible battery, the combination of an electrode plate of metallic magnesium, a second electrode

employing a depolarizing mass, ^{and} an alkaline zincate electrolyte containing an alkaline silicate, substantially as set forth.

10. In a reversible battery, the combination of an electrode plate of metallic magnesium, a second electrode employing a depolarizing mass, ^{and} an alkaline zincate electrolyte containing silicate of potash, substantially as set forth.

ZINC, COPPER OXID COUPLE

Black - Regular potassium hydroxide electrolyte.
 Red - Same KOH solution to which potassium
 cyanide has been added in different amounts
 as shown.
 Cells discharged at constant current of 1 ampere.
 W.E.H. 2/4/57



Folio No. 219BOX No. 5Serial No. 298,270

Applicant.

Address.

Thos A Edison Orange

Title

Celebrity Burning Film

Filed

Jan 27 1906Examiner's Room No. 1

Assignee

Thomas A. Edison, Inc.

Ass'g't Exec.

June 30, 1906

Recorded

July 7, 1906

Liber

5127Page 50Patent No. 1065,597

Issued

June 04-1913

ACTIONS.

U.S. Circuit May 12, 191332. Examination statement 3/4/13
33. Brief on behalf of petitioner 4/19/13.
34. Decision granting petition 5/3/13

- 1 Rejected Mar 24, 1906
- 2 Amended March 16, 1907
- 3 Rejection March 16, 1907
- 4 Letter to Commissioner March 26, 1907
- 5 Declaration of Infringement April 16, 1907
- 6 Preliminary Statement filed May 2, 1907
- 7 Testimony to be taken before June 10, 1907
- 8 Claimant's testimony to close Aug 10, 1907
- 9 Rebuttal testimony to close Sep 25, 1907
- 10 Oral hearing Oct 25, 1907 at 11 am
- 11 Petitioner's testimony to close Nov 10, 1907
- 12 Claimant's testimony to close Nov 11, 1907
- 13 Preliminary testimony to close Nov 26, 1907
- 15 Final hearing Dec 26, 1907 at 11 am
- 16 Petitioner's testimony to close Nov 10, 1907
- 17 Petitioner's appeal filed Oct 5, 1907
- 18 Petitioner's testimony to close Nov 14, 1907
- 19 Appeal October 19, 1908
- 20 Rejection Sept 17, 1909
- 21 Amended Apr 15, 1910
- 22 Rejected October 17, 1910
- 23 Amended Oct. 12, 1911
- 24 Rejected Oct. 28, 1911
- 25 Request for withdrawal of final rejection and request amended Oct 31, 1911
- 26 Amendment Oct. 28 - 1912
- 27 Rejected Nov 29, 1912
- 28 Request for reconsideration Dec 6, 1912
- 29 Office letter Jan. 10 - 1913
- 30 Petition March 22 - 1913
- 31 Hearing set for April 22 - 1913

FRANK L. DYER,

Counsel,

Orange, New Jersey.

VAULT

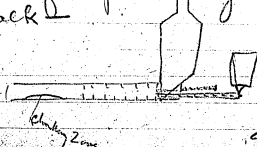
VAULT

Dec 26 1905

Refer-

Revised
Dec 26/05
J.D.

Patent a Kiln, The non-chinking part of which has projecting bricks to throw the orz. in combination with a settling chamber forming part of the stack & of such an increased area as will slow the speed of the Exit gas down sufficiently to cause practically all of the dust made by the action of the projecting bricks to settle & automatically pass into the kiln again - or to force the settlings into the kiln continuously by a screw feed or equivalent device - independent of the feed for the original feed of chack



Oct 24-1912. (1)

Notes on Stack Dust Settling
Patent.

Rejected Claims #1.

This claim is so broad that even if it were allowed I do not think it could be sustained as years ago a large chamber was inserted between the kiln and stack and while no conveyors were run through the chamber a screw was used just outside where the dust could flow by gravity and be returned to the stack box this constituting "movable means for positively returning material deposited in said chamber etc."

This claim does not seem to be important inasmuch as it could easily be applied to practice in the prior art.

(2)

Rejected Claim #2.

This claim is broad like #1 and covers nothing that could not be applied to the kilns in prior art with a screw directly behind the dust chamber.

It is apparently a weak claim.

Rejected Claim #4.

The projecting ledges of brick were used as early as 1900 to my knowledge. The Whitehall kilns had projecting brick and a belt conveyor behind the stack chamber which latter never worked owing to the dust being too hot. A screw might readily have been substituted.

The claim does not seem important.

(3)

Rejected Claim #5.

This is also very broad fits the description of the whitelash chambers as they were in 1900. The means for removing the material deposited was a failure. I do not know that the two devices were successfully used in any mill but some mills used one and some the other.

The claim does not seem specific enough to exclude prior practice.

(4)

Claims allowed

claims [#]3-[#]6-[#]7

It appears that all of these claims necessitate the building of the dust chamber up in the air above the bottom line of the kiln. Our experience is that an effective settling chamber must be very large and the cost of building it in the air would be prohibitive. Common experience shows that a down draft with the stack set to the side is more efficient than a direct upward draft.

Additional claim #8.

this is open to the same objection as claims 3-6 + 7.

St. Schieffer

Folio No. **220**

Serial No. **298,282**

Applicant.

Thos. A. Edison

Address.

Orange N.J.

Title

Improvements in Electric Automobile

Filed

Jan 27, 1906

Examiner's Room No.

Assignee

Ass'g't Exec.

Recorded

Liber

Page

Patent No.

Issued

ACTIONS.

- | | |
|--------------------------------|----|
| 1 <i>Rejected Apr. 7 1906</i> | 16 |
| 2 <i>Dropped March 7, 1907</i> | 17 |
| 3 | 18 |
| 4 | 19 |
| 5 | 20 |
| 6 | 21 |
| 7 | 22 |
| 8 | 23 |
| 9 | 24 |
| 10 | 25 |
| 11 | 26 |
| 12 | 27 |
| 13 | 28 |
| 14 | 29 |
| 15 | 30 |

FRANK L. DYER,

Counsel,

Orange, New Jersey.

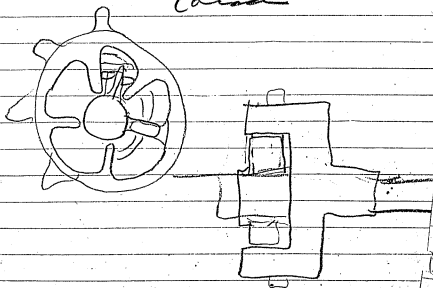
July 20 1906

Dyer

I want to patent a
buffer between the sprocket wheels
& the shaft in an automobile.

I have the drawing —

Edison



Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS A. EDISON,
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, County of Essex and State of New Jersey,

prays that letters patent may be granted to him for the improvements in

ELECTRIC AUTOMOBILES,

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Edison Laboratory, Orange, New Jersey, his
attorney, with full power of substitution and revocation, to prosecute this
application, to make alterations and amendments therein, to receive the patent,
and to transact all business in the Patent Office connected therewith.

Thos A Edison

SPECIFICATION.

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS ALVA EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, County of Essex and State of New Jersey, have invented certain IMPROVEMENTS IN ELECTRIC AUTOMOBILES, of which the following is a description:-

My invention relates to improvements in electric automobiles, by means of which I am enabled to materially reduce the sudden and objectionable strains to which the motor and the driving mechanism are subjected in starting from rest, and in effecting successive increases of speed. With these vehicles as now constructed, the electric motor is positively connected to the driving wheels through gears, chains, or other mechanical devices, which inevitably provide for more or less lost motion, so that in starting the motor from rest, opportunity is offered for the armature to acquire considerable speed before its power will be transmitted, so that the parts will therefore be subjected to very heavy strains. These strains are encountered to a less extent whenever the speed of the motor is successively increased. I propose to reduce the objectionable strains referred to by interposing between the electric motor and the driving wheels an elastic cushion or buffer, so as to thereby

absorb any sudden shock, without however, interfering in any way with the transmission of power from the motor. The elastic cushion in question is formed as a part of one of the wheels used in the transmission mechanism, so as to thereby be very simple, compact, and highly effective.

In order that the invention may be better understood, attention is directed to the accompanying drawing, forming part of this specification, and in which -

Figure 1, is a bottom plan view, illustrating the running gear of an electric automobile of the common type,

Figure 2, a sectional view on the line 2-2 of Figure 3, illustrating the interior construction of the sprocket wheel on the countershaft, shown in Figure 1, and

Figure 3, a longitudinal sectional view on the line 3-3 of Figure 2.

In all of the above views, corresponding parts are represented by the same numerals of reference.

The automobile shown in Figure 1, is provided with a driven rear axle 1, operated by a sprocket chain 2, from a sprocket wheel 3 on a countershaft 4, the latter carrying a spur gear 5, driven by a pinion 6, on the armature shaft of the electric motor 7, all as is common in this art. The elastic buffer, constituting the essential feature of my invention, may be made a part of either the main sprocket on the shaft 1, or the sprocket 3 on the countershaft, or the gear 5, or the pinion 6; and, when other forms of driving mechanism are used, it may be made a part of any one or more of the wheels employed in connec-

tion therewith. For the purpose of illustration, I show a spring buffer in connection with the sprocket wheel 3 on the countershaft 4, the specific construction being more clearly shown in Figures 2 and 3. Here the outer part of the sprocket is formed with a hub 8, loose on the shaft 4, and working against a collar 9, being locked against longitudinal movement by a cap 10, on the inner part of the wheel and rigidly secured to the shaft by a key 11, and locked in place by a bolt 12. The inner part of the wheel is formed with a plurality of ribs 13, alternating with corresponding ribs 14, formed integrally with the outer part of the sprocket wheel 3. Mounted between the ribs 13 and 14 as shown, are buffers 15, made preferably of rubber, although other elastic material or elastic forms may be substituted. Provision is made when rubber, or other non-compressible buffers are used, to allow for the displacement thereof, when subjected to pressure, preferably by forming the outer part of the wheel with recesses 16, as shown. By varying the size of these recesses, the extent of deformation of the buffers may be conveniently regulated to give the desired degree of elasticity, as will be evident. It will be obvious that when any sudden strains are encountered in the driving mechanism, relative movement will be afforded between the two parts of the sprocket wheel, thereby distorting certain of the springs or buffers 15, and absorbing the shock elastically. By providing sets of buffers on either side of the ribs 13 and 14, as shown, the shocks thus set up in the apparatus will be absorbed elastically in either direction of rotation of the motor.

Although I have specifically referred herein to the use of my improvements with electric automobiles, it will be understood that they may be used in connection with any desired types of motor vehicles, wherein, under present conditions, sudden shocks are encountered in the driving mechanism.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is as follows:-

1. In an automobile, the combination with the driven shaft, a driving motor and intermediate driving mechanism between the motor and said driven shaft, of means forming part of the driving mechanism for permitting the elements thereof to yield elastically when subjected to sudden shocks, substantially as and for the purposes set forth.

2. In an electric automobile, the combination with its driven shaft and driving motor, of an elastic connection between the same, permitting relative elastic movement of said motor and shaft under the effect of sudden strains, substantially as and for the purposes set forth.

3. In an automobile, the combination of a driven shaft, a driving motor and mechanical connections between the same, the latter employing a two-part wheel, the parts of which are movable relatively, and elastic cushions interposed between such parts, substantially as

and for the purposes set forth.

4. In mechanism between the motor and driven shaft of an automobile, a sprocket or gear wheel, comprising an exterior part having inwardly projecting ribs, an interior part having outwardly projecting alternately arranged ribs, and elastic buffers between the adjacent ribs of the two parts, one of said parts being formed with clearance spaces to accomodate the deformation of said buffers when subjected to sudden strains, substantially as set forth.

This specification signed and witnessed this day of 190

Thos. A. Edison

Witnesses:

1. Spencer L. Dyre
2. A. P. Kuhn

Oath.

State of New Jersey }
County of Essex } ss.,

THOMAS A. EDISON, the above named
petitioner, being duly sworn, deposes and says that he is a citizen of the United
States, and a resident of Llewellyn Park, Orange, County of Essex and
State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the
improvements in ELECTRIC AUTOMOBILES,

described and claimed in the annexed specification; that he does not know and
does not believe that the same was ever known or used before his invention or
discovery thereof; or patented or described in any printed publication in the
United States of America or any foreign country before his invention or
discovery thereof, or more than two years prior to this application; or patented
in any country foreign to the United States on an application filed more than
twelve months prior to this application; or in public use or on sale in the
United States for more than two years prior to this application; and that no
application for patent upon said invention has been filed by him or his legal
representatives or assigns in any foreign country.

Thos. A. Edison

Sworn to and subscribed before me this day of 190

Spencer L. Dyre

[Seal]

Notary Public.

298,282

270

Jan. 27, 1906

Fig. 2

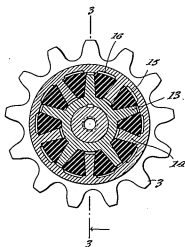


Fig. 3

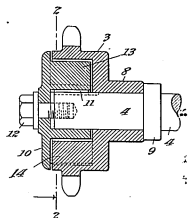
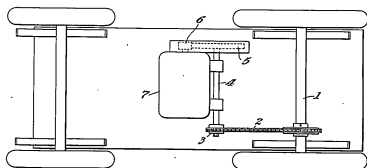


Fig. 1



Witnesses:
Frank N. Lewis
Charles Holden

Inventor:
Thomas A. Lewis
by
Frank L. Allen

Att'y.

Div. 12 Room 324
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-260.

RAC

Paper No. 1.
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

April 7, 1906.

Thomas A. Edison,
Care Frank L. Dyer,
Edison Laboratory, Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application,
for Electric Automobiles, filed Jan. 27, 1906, S. No. 298,293.

F. L. Allen
Commissioner of Patents.

This case has been examined.

Claims 1, 2, and 3 are rejected on the patent to Allington,
486,068, Nov. 15, 1892, (Electric Locomotives.)

Claim 4 is rejected on the patent above cited, there being
no invention in providing clearance space in view of the patent to
Hunt, 472,707, April 12, 1892, (Shaft Couplings,) or Bacon,
309,679, Dec. 23, 1884, (Gearing, Yieldable.)

avant reproduction

Folio No. 223Serial No. 299,484

Applicant.

Thos. A. Edison

Address.

Orange N.J.Title Feeding Apparatus for Cement KilnsFiled Filed Dec. 5/1906Examiner's Room No. 116

Assignee

Ass'g't Exec.

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Page

Patent No.

Issued

ACTIONS.

- | | | | |
|----|------------------------------|----|--------------------------------|
| 1 | Rejection Mar. 5, 1906 | 16 | <i>Abandoned</i>
<i>702</i> |
| 2 | Amended Sept. 28, 1906 | 17 | |
| 3 | Rejection Oct. 11, 1906 | 18 | |
| 4 | Amended August 16, 1907 | 19 | |
| 5 | Rejection September 11, 1907 | 20 | |
| 6 | Amended August 13, 1908 | 21 | |
| 7 | Rejection Oct. 13, 1908 | 22 | |
| 8 | Amended Oct. 8, 1909 | 23 | |
| 9 | Rejected Jan. 27, 1909 | 24 | |
| 10 | Amended Nov. 19, 1910 | 25 |  | Not by instructions of the Patent Feb. 2, 1911 HC |
| 11 | Rejected Jan. 7, 1911 | 26 | |
| 12 | Amended Jan. 3, 1912 | 27 | |
| 13 | Rejection Feb. 6, 1912 | 28 | |
| 14 | | 29 | |
| 15 | | 30 | |

FRANK L. DYER,

Counsel,

Orange, New Jersey.

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS A. EDISON,
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, County of Essex and State of New Jersey;

prays that letters patent may be granted to him for the improvements in

FEEDING APPARATUS FOR CEMENT KILNS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Edison Laboratory, Orange, New Jersey, his
attorney, with full power of substitution and revocation, to prosecute this
application, to make alterations and amendments therein, to receive the patent,
and to transact all business in the Patent Office connected therewith.

Thos A. Edison

-SPECIFICATION-

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS ALVA EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, County of Essex and State of New Jersey, have invented certain improvements in FEEDING APPARATUS FOR CEMENT KILNS, of which the following is a description:-

My invention relates to various new and useful improvements in feeding apparatus, which has been designed for introducing finely pulverized unburnt cement material or "chalk" into the upper end of rotary kilns for burning Portland cement clinker. In my patent No. 802,631 of October 24, 1905, I describe an apparatus for this purpose, in which a long conveyor screw is mounted below a bin or hopper and serves to introduce the material into the upper end of the kiln and close to the lining thereof in successive increments. I have found it important in actual practice that the conveyor screw for thus introducing the material into the kiln should be of a relatively coarse pitch. Such a conveyor is not only cheaper than one having a finer pitch, but is also less affected by the heat and warps to a much less extent than a screw of fine pitch. Even with a coarse pitch, it is impossible to fit the same closely to the tube in which it works, and if a fine pitch screw were used, greater clearance would have to be provided, which would

seriously influence the desired regularity of the feed. Furthermore, if a fine pitch screw were attempted to be used, the high speed at which it would have to be operated and the extent of the surface thereof in contact with the enclosing tube would enormously increase the friction. It is impossible to make use of a bearing at the inner end, owing to the great heat. The principal objection, however, to a very coarse pitch screw is that the inclination thereof is so great as to frequently allow material from the storage bin to be forced by its weight longitudinally past the screw into the kiln; and even when this result does not take place the pressure of the material in the storage bin is generally enough to influence the regularity of the feed. It is highly important that the feed should be regular so that a constant load of material may be fed to the kiln, in order that the best results in practice may be secured, requiring less regulation of the fuel and permitting the kiln to always work at its best and most economical capacity. The essential object of my present invention is to provide a feeding mechanism for the purpose, in which a coarse pitch screw is used, and wherein the objection to the employment of such screws is overcome. To this end the invention comprises a feed mechanism for rotary cement kilns, employing a storage bin for containing the chalk, a coarse pitch feed screw or conveyor, for introducing the unburnt material into the kiln, and an auxiliary conveyor, (preferably a feed screw of fine pitch, turning at relatively high speed) interposed between the storage bin and the main conveyor, and adapted to withdraw a uniform amount of material from the storage bin and deposit the same upon the main conveyor, by which it will be introduced within the kiln.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming part of this specification, and in which -

Figure 1, is a side elevation partly in section showing the main conveyor broken away and illustrating the hopper, with which the storage bin is connected,

Figure 2, a plan view of the same,

Figure 3, a section on the line 3-3 of Figure 1, through the main and auxiliary conveyors, and

Figure 4, a section on the line 4-4 of Figure 1, looking towards the motor.

In all of the above views corresponding parts are represented by the same numerals of reference.

The feed mechanism is carried on a car 1, having supporting wheels 2-2, working on tracks 3-3, in order that the position of the main conveyor screw can be adjusted with respect to the kiln. This main conveyor screw 4 is of a very coarse pitch, as shown, and is mounted in a tube or barrel 5, sufficient looseness of fit being provided to accommodate any warping to which the conveyor screw may be subjected. The shaft 6 of the main conveyor carries a spur gear 7, with which a pinion 8 engages; said pinion is mounted on a counter-shaft 9, which carries a spur gear 10, driven by a pinion 11 on the motor shaft 12. Any suitable source of power is applied to the shaft 12, an electric motor 13 being shown for the purpose. A clutch 14 may be interposed in the shaft 12, so as to permit the motor to be disconnected whenever desired. The motor shaft 12 carries a gear 15, which engages and drives a gear 16, on the shaft 17, of the auxiliary conveyor 18, the latter being of a

much finer pitch than the main conveyor 4, as shown. The auxiliary conveyor 18 receives material from the hopper 19, with which connects the lower end of a storage bin (not shown), and delivers the material to the main conveyor 4, through a passage 20. The gears 7, 8, 10 and 11, are enclosed by a casing 21, and the gears 15 and 16 are enclosed by a casing 22, so as to exclude dust. The gearing between the motor shaft 12, and the shaft 6 of the main conveyor 4 is so proportioned relatively to the gearing between the motor shaft and the shaft 17 of the auxiliary conveyor 18 that the main conveyor 4 will turn slightly more rapidly than is necessary, to accommodate the full load of material delivered by the auxiliary conveyor 18, whereby the auxiliary conveyor will deliver a full and uniform load of material to the main conveyor, and the loss in feeding capacity, due to the looseness of fit between the main conveyor 4 and its containing tube or barrel 5, will not in any way interfere with the delivery by the main conveyor of the full load of material supplied by the auxiliary conveyor. In operation, the material delivered by the storage bin to the hopper 19 will fill the latter and be effectively choked by the auxiliary conveyor 18, owing to the fine pitch thereof, which will resist any independent movement of the material past the same, due to its weight. In operation, the auxiliary conveyor 18 feeds to the main conveyor always a definite amount of material from the storage bin, dependent upon the speed of rotation of the auxiliary conveyor and the amount of material thus fed will be independent of the weight of material in the storage bin, which as I have before explained, is not the case when a coarse pitch screw is

Serial 19
Aug 13, 1938

used, connected directly with the supply of material.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is as follows:

1. In cement ^{feeding mechanism} ~~feeding mechanism~~, the combination with a hopper for receiving a supply of material, and a coarse pitch feed screw, ^{for receiving material from the hopper} ~~and an auxiliary conveyor~~ normally blocking the flow of material from the hopper to the main conveyor, but adapted to deliver a uniform load of material from the hopper to the main conveyor, substantially as and for the purposes set forth.

2. In cement feeding apparatus, the combination with a hopper for receiving a supply of material, and a coarse pitch feed screw adjacent to the same, of a fine pitch conveyor between the hopper and a coarse pitch feed screw for feeding a uniform load of material between the two, substantially as and for the purposes set forth.

3. In cement feeding apparatus, the combination with a fine pitch auxiliary feed screw and a hopper conveying material to the same, perpendicular to its axis at one of its ends, of a coarse pitch feed screw extending substantially parallel with a fine pitch screw and receiving material delivered therefrom to its other end, substantially as and for the purposes set forth.

4. In cement feeding apparatus, the combination with a hopper for receiving fine material, an auxiliary fine pitch feed screw connected therewith, and uniformly removing material therefrom, and a main

coarse pitch feed screw receiving material delivered
by the fine pitch screw, of a driving shaft, and gear-
ing between the driving shaft and the two feed screws
for rotating the feed screws, the speed of the main screw
being slightly greater proportionately than that of the
auxiliary screw, substantially as and for the purposes
set forth.

In witness whereof, I claim 1 to 5 inclusive
as my invention.
Signed at Albany, New York

Witnessed
Aug 16, 1888

This specification signed and witnessed this / day of Feb 1906

Thos A Edison

Witnesses:

1. Anna K. K. K.
2. Frank L. Dyer

Oath.

State of New Jersey }
County of Essex } ss.,

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Orange, County of Essex and State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the improvements in FEEDING APPARATUS FOR CEMENT KILNS,

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 7 day of Feb. 1906

Thos A Edison

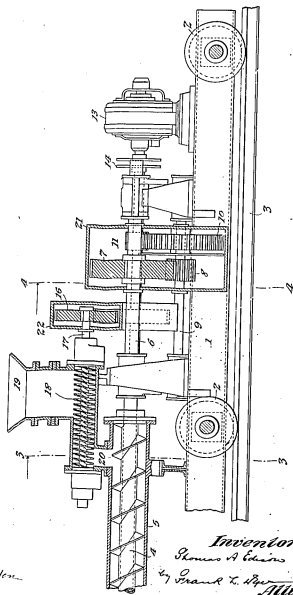
Frank L. Dyer.

[Seal]

Notary Public.

(X)

Fig. 1.



Witnesses:
 James H. Lewis
 R. C. Holden

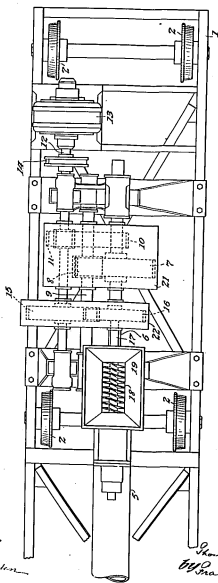
Inventor:
 James A. Holden
 by Grant L. Roper
 Atty.

298,434.

3

11
1905

Fig. 2



Witnesses:
Frank Wilson
Elias Holden

Inventors:
Thomas A. Edison
By Frank L. Ryan
Attorney

299,414
3

11
171

Fig. 4

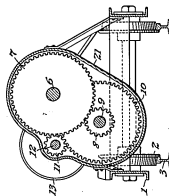
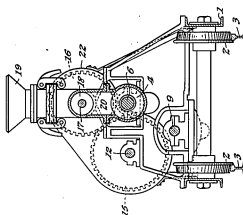


Fig. 3



Witnesses:
Frank D. Lewis
R. L. S. Holden

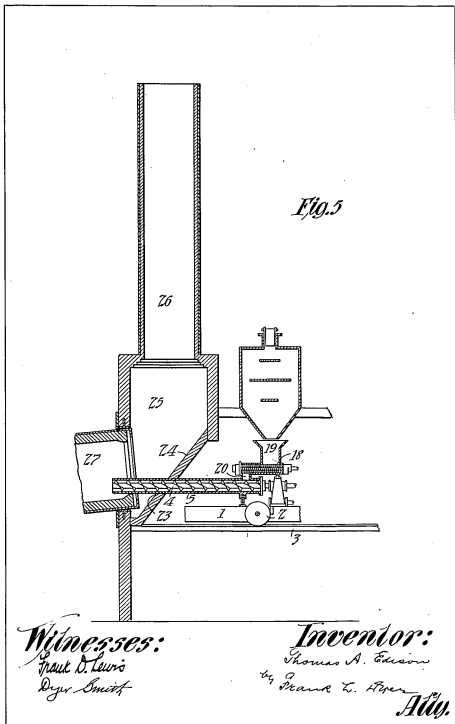
Inventor:
Thomas A. Edison
By Frank D. Lewis
Atty.

223

No. 258,458

7

19
198



2-260.

Div. 4 Room 232

All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

MEP

Paper No. 1

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C., March 5, 1906



Thomas A. Edison,

c/o Frank L. Dyer,

Orange, N.J.

MAR 5 1906

Please find below a communication from the EXAMINER in charge of your application,
Serial No. 299,484, filed February 5, 1906, for Feeding Apparatus
for Cement Kilns.

D. I. Allen
Commissioner of Patents.

Case examined.

The 1st, 2d, and 3d claims are met in the patents to Bussells
604,348, May 17, 1898 and Berner, 617,591, Jan. 10, 1899 (Con.
Screw), see also the patent to Church, 304,615, Sept. 2, 1884 (same
class).

Said claims are rejected.

UNITED STATES PATENT OFFICE

Thomas A. Edison

FEEDING APPARATUS FOR
CEMENT KILNS

Room No. 232

Filed February 5, 1906

Serial No. 299,484

HONORABLE COMMISSIONER OF PATENTS

S I R : - -

Replying to Office action of
March 5th, 1906, please amend the above entitled case as
follows:

Rewrite claims 1, 2 and 3 as follows:

1. In a cement burning apparatus, the combination of a rotary cement kiln with feeding mechanism therefor comprising a hopper for receiving a supply of material, a coarse pitch feed screw communicating with the interior of said kiln, and an auxiliary conveyor normally blocking the flow of material from the hopper to the main conveyor but adapted to deliver a uniform load of material from the hopper to the main conveyor, substantially as set forth.

2. In a cement burning apparatus, the combination of a rotary cement kiln with feeding mechanism therefor comprising a hopper for receiving a supply of material, a coarse pitch feed screw adjacent the same and communicating with the interior of said kiln, and a fine pitch conveyor between said hopper and coarse pitch feed screw for feeding a uniform load of material from one to the other, substantially as set forth.

Cancelled Sept. 6, 1907

The
Kiln
and
the
above
figs.

A

3. In a cement burning apparatus, the combination of a rotary cement kiln with feeding mechanism therefor comprising a fine pitch auxiliary feed screw, a hopper for supplying material to the same, and a coarse pitch feed screw ^{extending} substantially parallel with said fine pitch feed screw for receiving material delivered therefrom and ^{the said coarse pitch screw having its bearing at the end within the kiln} delivering it to the kiln, substantially as set forth.

Revised Feb 22, 1914

- R E M A R K S -

The references clearly fail to anticipate the invention. Patent No. 604,348 to Russell discloses a device for cooking fish wherein a horizontal Kettle or steam cylinder A is provided with a screw conveyor F for passing the fish through the same. The purpose and function of applicant's device is not present and is not suggested. The structure of the reference belongs to an art which has no analogy with that of applicant's device, but if there were any analogy it is submitted that the kettle A in which the fish are tried out would correspond to the cement kiln, so that the vertical feed screw m of the reference would correspond with the main feed screw 4 of applicant and there is nothing to correspond with the auxiliary or fine pitch screw 16 of applicant.

Patent No. 617,391 to Berner discloses an apparatus for drying sand or other materials. A rotary drum or cylinder A is adapted to receive and dry the sand. This cylinder corresponds roughly with the cement kiln of applicant. The feeding device consists of a spiral conveyor R which corresponds to the conveyor 4 of applicant. It should be noted however that in the reference the shaft of the spiral conveyor is provided with a bearing at each end, one bearing being located inside of the cylinder A

(see Fig.1). Such a structure as this would be impossible in a cement burning apparatus on account of the high temperatures employed and this is one of the reasons why applicant is precluded from using a fine pitch conveyor as the main supply. Obviously there is no auxiliary feeding device for supplying the main feed R of this reference.

Patent No.504,615 discloses merely means for mixing or proportioning materials which includes a number of spiral conveyors. There is no disclosure of applicant's invention which relates and is limited to cement burning apparatus .

Respectfully submitted.

THOMAS A. DUNSON

By F. L. D.

his attorney.

Orange, New Jersey

September 28, 1906.

773

2-360.

Div. 4 Room 232
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

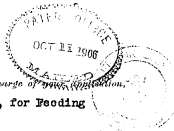
163P

Paper No. 3
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

October 11, 1906

Thomas A. Edison,
c/o Frank L. Dyer,
Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application,
Serial No. 299,484, filed February 5, 1906, for Feeding
Apparatus for Cement Kilns.

F. I. Allen
Commissioner of Patents.

Case re-examined on amendment filed September 29, 1906;

The new 1st, 2d and 3rd claims set forth as an element of the
combination a "rotary cement kiln". This element is not
illustrated as required by Rule 50. The 1st and 2d claims,
however, present nothing of invention over the references
Russells and Berner of record.

The 3rd claim is met in Berner, of record.

The 1st, 2d and 3rd claims are rejected.

$\frac{8}{8} \times \frac{10}{10} = \frac{80}{80}$

HONORABLE COMMISSIONER OF PATENTS:

Replying to Office letter of October 11,
1906, please amend as follows:

1. A feeding mechanism for rotary cement kilns comprising a hopper for receiving a supply of material, a coarse pitch feed screw communicating with the interior of the kiln and an auxiliary conveyor ^{substantially parallel thereto} normally blocking the flow of material from the hopper to the main conveyor but adapted to deliver a uniform load of material from the hopper to the main conveyor, substantially as set forth.

Insert E" Claims 3-4 & 5

1.

Secret. "H. Blain 1 Oct 11/09.

3. A feeding mechanism for rotary cement kilns comprising a fine pitch auxiliary feed screw, a hopper for supplying material, to the ~~screw~~ ^{model for the feed screw}, and a coarse pitch feed screw extending below and substantially parallel with said fine pitch feed screw for receiving material delivered therefrom and delivering it to the kiln, the said coarse pitch feed screw having no bearing at the end within the kiln, substantially as set forth. -

Insert claims 7 & 8.

Aug 13/95.

REMARKS -

This invention deals with the conditions present in the introduction of finely ground unburned cement forming material into rotary cement burning kilns, as is fully stated in the specification and in the argument heretofore made. In this art the elements claimed are of peculiar utility. The fine pitch conveyor screw for receiving the finely ground "flour", and the coarser pitch screw for delivering the same to the kiln, set out in claims 2 and 3, and the combination of these conveyors are of particular importance. This "flour" acts very much like water; it has scarcely any cohesion or adhesion, and if a quantity were poured on a flat surface it would spread out very much as water would. For this reason a fine pitch screw is provided to positively remove this material from the hopper.

For the reasons fully stated on pages 1 and 2 of the specification, a coarse pitch feed screw must be used for actually introducing the cement forming material within the kiln. By the combination of these two conveyors, as set forth, an efficient device is formed for the purpose named. The references, which deal with entirely different conditions, offer no suggestion as to the way to remove the

difficulties in connection with the introduction of the finely ground cement forming material within a highly heated cement burning kiln.

The claims fully bring out the novelty of applicant's invention and it is respectfully submitted that they should be allowed.

THOMAS A. EDISON

By Grant & Dyer
His Attorney

Orange, New Jersey

August 16th 1907.

Div. 4, Room 232
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-200.
RPM.

Paper No. 5.
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.

September 4, 1907.

Thomas A. Edison,

Care of Frank L. Dyer,

Edison Laboratory,

Orange, New Jersey.

Please find below a communication from the EXAMINER in charge of your application.

Feeding Apparatus for Cement Kilns - Filed Feb. 5, 1906 -
Serial No. 299,484.

E. B. Moore

Commissioner of Patents.

Case reexamined on amendment filed Aug. 17, 1907.

The new 1st and 2nd claims are met in the Patent to
Russells of record, to connect his hopper feeding screw and
coarse pitch screw up to a kiln, is all applicant has done, as
covered by said claims, which amounts to merely a double use of
the device. The element of the combinations in said 1st and 2nd
claims, "communicating with the interior of the kiln", is not
shown, and even if it were, the scope of the said claims would
be the same.

If the 3rd claim is to stand over the references, the
matter of the coarse pitch screw "having no bearing at the end
within the kiln" should be illustrated, under Rule 50.

The 1st and 2nd claims are rejected.

UNITED STATES PATENT OFFICE.

Thomas A. Edison)
FEEDING APPARATUS FOR)
CEMENT KILNS)
Filed February 5, 1906)
Serial No. 299,484.)

Room No. 252

HONORABLE COMMISSIONER OF PATENTS:

S I R : --

In response to Office
action of September 4, 1907, please amend the above entitled
case as follows:

Page 3 of the Specification, after line 11 insert -
Fig. 5 is a sectional elevation of the receiving end of a
rotary cement kiln, and also shows part of the main conveyor
screw, and method of mounting the latter - .

Page 5, after line 1, insert the following:

In fig. 5, the method of mounting the feeding
apparatus with respect to a rotary cement kiln is illustrated.
The tube 5 of the main conveyor screw 4 is supported in
sliding contact with edge 23 of an opening in wall 24 of
passage 25 leading to stack 26 . The end of tube 5 is
inserted within the receiving end of kiln 27 a sufficient
distance for proper feeding. It will be noticed that the
shaft of the conveyor screw 4 has no bearing at its end
within the kiln, the screw being supported at this end
solely by the convolutions of the screw.

It will be understood that, while this invention
has been described in connection with rotary cement kilns,
it is equally applicable to the purpose of feeding finely

powdered material of any sort, where a uniform feed is desired, into any sort of furnace or vessel maintained at a high heat.

Claim 1, line 4, after "conveyor" insert - substantially parallel thereto - .

Claim 2, line 5, after "conveyor" insert - substantially parallel thereto - . Line 6, cancel - "one to the other" - and substitute - the former to the latter - Cancel from "serving" in line 6 through "atmosphere" in line 8, and substitute therefor - normally blocking the flow of material from the hopper to the coarse pitch feed screw - .

Insert the following claims as 3, 4 and 5.

2 (X) A feeding mechanism for rotary cement kilns comprising a hopper for receiving a supply of material, a feed screw for removing the material from the bottom of said hopper, of a pitch of such fineness that the material can not be forced longitudinally thereof by the superincumbent weight of the material in the hopper, and a coarse pitch feed screw communicating with the interior of the kiln, and which material is delivered by said first named feed screw at a point beyond the hopper, substantially as set forth.

3 (X) A feeding mechanism for rotary cement kilns comprising a coarse pitch conveyor screw communicating with the interior of the kiln, for introducing material therein at a uniform rate, means for supplying ^{all} the material to be conveyed ^{by} to said conveyor screw ^{to the latter} at a uniform rate no greater than the first named rate, and not under pressure, substantially as set forth.

(5) A feeding mechanism for rotary cement kilns comprising a coarse pitch conveyor screw communicating with the interior of the kiln for introducing material therein at a uniform rate, means for adjusting the position of the conveyor screw with respect to the kiln, and means for supply-

Substant E " Aug 13 1908.

ing material to be conveyed to said conveyor screw at a uniform rate no greater than the first named rate, and not under pressure, substantially as set forth.

Renumber Claim 3 as Claim 6. Add the following claims as 7 and 8.

Revised Claim 7
5(7) A feeding mechanism for rotary cement kilns, comprising a coarse pitch conveyor screw, communicating with the interior of the kiln for introducing the material therein at a certain rate, a tube in which said screw is contained with a somewhat loose fit, means for supplying material to said screw at substantially the rate at which it is to be introduced into the kiln, and means for rotating the screw at such a rate as to compensate for the loss of feeding capacity of said screw, due to its looseness of fit, substantially as set forth.

Insert 7 Aug 13 1908.
6(8) In cement feeding apparatus, the combination with a hopper for receiving fine material, an auxiliary fine feed pitch screw, connected therewith, and uniformly removing material therefrom, and a main coarse pitch feed screw receiving material delivered by the fine pitch screw, of a driving shaft, and gearing between the driving shaft and the two feed screws for rotating the feed screws ^{at such speeds that} the speed of the main screw ^{will be} slightly greater proportionately to the amount of material to be fed, than that of the auxiliary screw, substantially as set forth.

REMARKS

The patent to Bussells is apparently the only reference on which the Examiner thinks he can rely to anticipate some of the claims, and it is thought, certainly as amended, they are patentable over this and other

references. The difference in structure is now pointed out that the auxiliary and main feed screws are parallel with each other. With the structure shown and claimed, a result not contemplated by Bussells, and which would not be possible with his structure, is achieved. The main object of the auxiliary screw of Bussells is to jam the fish or other material to be cooked, down into the neck of the hopper to such an extent that it would be impossible for steam to escape from the ^{/steam} cylinder A. This would necessitate forcing the fish down into the cylinder A under pressure, and at a somewhat greater rate than that at which they could be carried away by the main screw. If this structure were used for applicant's purpose, the very condition which applicant has design^{/ed} his improvement to remedy, would be aggravated, namely, the finely pulverized chalk material would be forced down into the cylinder A under a pressure even greater than that which would be given it by the weight of the material above it in the hopper, if there were no force feed in the hopper L. This pressure would force the material past the convolutions of the coarse pitch screw and an irregular feed would result. The auxiliary screw in the case of Bussells does not block the flow of material from the hopper to the main conveyor.

The distinctions here pointed out are brought out in the claims, and the Examiner's objections as to the lack of illustration have been complied with. Claim 3 now numbered as Claim 6 is illustrated as to the feature of the feed screw having no bearing at the end within the kiln, and is apparently therefore allowable. Present Claim 8 is substantially original Claim 4 of the first set of claims, which never has been under rejection, and was apparently cancelled through inadvertence in amendment of August 17, 1907.

The Examiner states that all applicant has done is to connect Bussell's hopper feeding screw and coarse pitch feed screw up to a kiln, which, he states, is merely a double use of the device. Applicant has now pointed out the various differences in structure and also the differences in the results attained, so that in place of the double use, it would seem that a new use has been attained, which, according to the decisions, would render the claims patentable, even though there were no essential differences of structure. A number of decisions might be cited in this connection. For example, Moore vs. Schaw, 118 F 602, which holds that a device relating to one art is not anticipated by a like device taken from an entirely foreign art, where the latter was not intended by its maker, nor actually adapted, to perform the functions of the former.

Diamond Drill & Machine Co. vs. Kelly Bros., 120 F 289, states that a literal mechanical correspondence is not necessarily an anticipation. The principles of mechanics are always the same, and, in the almost endless combinations of them which are possible, it is not to be expected that duplications will not occur; where they do appear, the question is whether the new use is so closely analogous as to have been presumably brought about by what had preceded it, or whether it is so remote and different that the result can not be ascribed to mere suggestion.

It certainly can not be contended that the method of Bussell for preventing the escape of steam from the cooking cylinder by jamming the fish down into the mouth of the cylinder, could suggest to applicant the method of feeding cement into a kiln, whereby the advantages of using a coarse pitch screw for communicating with the interior of the kiln could be saved, while also obviating the

difficulty which has heretofore gone with the exclusive employment of the coarse pitch screw for ~~this~~ purpose with the finely pulverized material, that the material would tend to creep past the convolutions of the screw and so feed irregularly. The decisions go much farther than is necessary to bear out applicant's contention. For example, it has been decided in the case of Canda vs. Michigan Malleable Iron Co., 124 F 486; 61 C. C. A. 194. (6th Cir.) that a patent is not void for anticipation because of prior publications or patents describing or claiming devices which might, in the light of the patented device, be so constructed as to be capable of the same use as described and contemplated for the patented device, where such prior descriptions give no hint of such use or change.

In the case of Forsyth vs. Garlock, 142 F 461, 462 (1st Cir., 1906), it was decided that the adaptation of a sheet material made up of a metal sheet alternating with one or more rubber sheets, to the use of a gasket for steam packing, may involve invention notwithstanding the use of substantially the same composite sheet intended for other purposes.

Respectfully submitted,

THOMAS A. EDISON

By Frank L. Beyer

His Attorney

Orange, New Jersey

August 13 1908.

773

Div. 4 Room 232
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

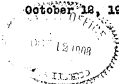
2-280.
MSP-378

Paper No. 7
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

October 18, 1908

Thomas A. Edison,
c/o Frank L. Dyer,
Orange, N.J.



Please find below a communication from the EXAMINER in charge of your application,
Serial No. 299,484, filed February 5, 1906, for Feeding
Apparatus for Cement Kilns.

E. B. Moore

Commissioner of Patents.

Case re-examined on amendment filed August 14, 1908:

The following new references are cited:

- ✓ Clark, 742,591, Oct. 27, 1903 (193-So.X)
- ✓ Church, 304,626, Sept. 2, 1884 (1b)
- ✓ Skinner, 476,616, May 24, 1892 (1b)
- ✓ Carey, et al, 409,560, Aug. 20, 1889 (1b)
- ✓ Shiner, 844,623, Feb. 19, 1907 (1b).

Claims 1, 2, 3, 4 and 6 are directly met in Clark and
are rejected thereon. Neither is it seen that they present
patentable distinctions over Church.

Claim 5 is rejected on Clark, in view of Carey, et al.

Claims 7 and 8 are rejected on Clark, considered
jointly with Church. Note also the gear connection between the
two conveyors shown by Skinner.

Edison

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)

FEEDING APPARATUS FOR)
CEMENT KILNS)

Room No. 232.

Filed February 5, 1906)

Serial No. 299,484)

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to Office action of
October 12, 1908, please amend the above entitled case
as follows:

✓ Cancel Claims 1 and 2 and substitute the follow-
ing as Claim 1:

Cancelled 7/10/10
1. A feeding mechanism for rotary cement kilns
comprising a single hopper for receiving the total supply
of material to be fed to the kiln, a coarse pitch feed
screw adjacent the same and communicating with the in-
terior of the kiln, and a conveyor much finer in pitch
than said coarse pitch feed screw and substantially para-
llel thereto between said hopper and coarse pitch feed
screw for feeding a uniform load of material from the
former to the latter and normally blocking the flow of
material from the hopper to the coarse pitch feed screw,
substantially as set forth.

✓ Claim 4, line 4, insert - all - after "supplying".
Line 5, cancel "to" before "said" and substitute - by - .

- ✓ Same line, insert - to the latter - after "screw".
- ✓ Renumber Claims 3 and 4 as 2 and 3.
- ✓ Cancel Claim 5.
- ✓ Claim 6, line 3, insert - all the - after "supplying". Same line, insert - needed for the kiln - after "material". Same line, cancel "same" and substitute - said screw - . Renumber this claim as 4.
- ✓ Claim 8, line 7, after "screws" insert - at such speeds that - . Line 8, cancel "being" and substitute - will be - .
- ✓ Renumber Claims 7 and 8 as 5 and 6.

R E M A R K S

None of the references discloses the idea of an auxiliary conveyor of very fine pitch supplying uniform loads of material to the main conveyor of coarse pitch, the latter delivering the material to the kiln. This is thought to be the gist of applicant's invention, namely, interposing between the hopper and the main conveyor a screw of such fine pitch that the flow of cement material past the convolutions of the screw on account of the pressure of the material in the hopper will be prevented. In the patent to Clark and the other references, the two conveyor screws seem to be of the same pitch. In none of these references is the function of the auxiliary conveyor the same as that of applicant, and none of them allude to any advantage in forming the auxiliary conveyor with a pitch sufficiently fine to block the flow of material past the same. This is a patentable distinction over the references and is not a mere differ-

ence in degree, since a new function is attained thereby. The auxiliary conveyor of Clark is intended merely for conveying a certain component of the material to the main conveyor for mixing the same there with the main supply of material which is fed directly to the main conveyor. The patent to Church and the other references newly cited by the Examiner would seem to be even less pertinent than the patent to Clark.

It should be further noted that none of the references discloses the idea of furnishing means for rotating the main screw at such a rate as to compensate for the loss of feeding capacity of said screw due to its looseness of fit. Some of the references certainly show gear connections between the two screws, but the desirability of the function brought out by applicant's construction is not alluded to, and since a novel and useful function is attained by properly proportioning the gears, it would seem that the provision of means adapted to rotate the conveyor at such a proportionate speed is patentable.

Reconsideration and allowance of all the claims are requested.

Respectfully submitted.

THOMAS A. EDISON

By Harold P. Dyer

His Attorney.

Orange, New Jersey

October 8, 1909.

112

Div. 4 Room 232
ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

2-200.

SM-Spe

Paper No. 9

All communications respecting this
SM-Spe should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

Nov. 22, 1909.

Thomas A. Edison,

C/o Frank L. Dyer,

Edison Laboratory, Orange,



Please find below a communication from the EXAMINER in charge of your application.

Serial No. 299, 404, filed Feb. 5, 1906, for Feeding Apparatus for
Cement Kilns.

E. B. Moore

Commissioner of Patents.

Case re-examined on amendment filed Oct. 9, 1909.

The claims, 6 in number, are rejected on the references
of record. As to the Clark construction the lower hopper may be
omitted altogether; or leaving it as it is, there is no necessity
of feeding through it. In either case all the material would
then come from the upper hopper. The loosely fitting screws
are plainly shown in the Clark reference or by Church.

*Confidential
Print*

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON)
FEEDING APPARATUS FOR)
CEMENT KILNS.)
Filed February 5, 1906,) Room No. 232
Serial No. 299,484)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of November 22, 1909, please amend the above entitled case as follows:

Cancel the claims now in the case and

substitute in place thereof the following claims:

1. *Revised 1910* A mechanism for feeding fine material into cement kilns comprising a tube having an open end communicating with the kiln, a hopper having a passage communicating with said tube, an auxiliary fine pitch feed screw for uniformly removing material from said hopper, and a main coarse pitch feed screw mounted in said tube substantially parallel with said auxiliary screw and receiving material delivered thereby, the said tube being closed throughout except at said open end and at said passage, substantially as described.

2. A mechanism for feeding fine material into cement kilns comprising a tube having an open end communi-

Amended 11/3/52

ating with the kiln, a hopper having a passage communicating with said tube, an auxiliary fine pitch feed screw for uniformly removing material from said hopper, a main coarse pitch feed screw mounted in said tube substantially parallel with said auxiliary screw and receiving material delivered thereby, said coarse pitch feed screw having no bearing at the end of the tube communicating with the kiln, and the said tube being closed throughout except at said open end and at said passage, substantially as described.

3. A mechanism for feeding fine material into cement kilns comprising a tube having an open end communicating with the kiln, a hopper having a passage communicating with said tube, means for removing material from said hopper at a uniform rate but not under pressure, and a main coarse pitch feed screw mounted in said tube so as to receive the material delivered by said means and to deliver the same to the kiln at a rate no less than the first mentioned rate, the said tube being closed throughout except at said open end and at said passage, substantially as described.

4. A mechanism for feeding fine material into cement kilns comprising a tube having an open end communicating with the kiln, a hopper having a passage communicating with said tube, an auxiliary screw for removing material from said hopper at a uniform rate but not under pressure and a main coarse pitch feed screw mounted in said tube so as to receive the material delivered by said auxiliary screw and to deliver the same to the kiln at a rate no less than the first mentioned rate, the said tube being closed throughout except at said open end and at

2000000
41-
said passage, substantially as described.

2
5. A mechanism for feeding fine material into cement kilns comprising a tube having an open end communicating with the kiln, a hopper having a passage communicating with said tube, an auxiliary screw for removing material from said hopper at a uniform rate and a main coarse pitch feed screw loosely mounted in said tube substantially parallel with said auxiliary screw) and receiving material delivered by said fine pitch screw, a driving shaft, and gearing between the driving shaft and the two feed screws) for rotating the feed screws at such a speed that the speed of the main screw will be slightly greater proportionately to the amount of material to be fed than that of the auxiliary screw, the said tube being closed throughout except at said open end and at said passage, substantially as described.

R E M A R K S.

The old claims have been canceled without prejudice to the right to again insert them; and new claims, which it is thought define the invention more clearly, have been inserted in place thereof.

Claims 1, 2 and 5 include a main feed screw, an auxiliary feed screw parallel therewith and adapted to feed material uniformly to said main screw, and a tube in which said main screw is mounted, the said tube being open only at the place where the material enters from the auxiliary screw and where it leaves said tube. None of the references disclose these combined features. The devices shown in the patents to Clark and Church not only do not

have this combined structure but are designed for a use very different from that of the applicant's device. The latter contains an auxiliary screw for uniformly feeding all of the material to be conveyed to a main screw; the former devices have auxiliary screws for supplying only one of a number of substances to be mixed. The form of feeding device shown by the applicant, as fully set forth in pages 1 and 2 of the specification, has decided advantages over previous devices of the kind; and as the claims differentiate structurally from the references, it is submitted that they should be allowed.

Attention is again directed to the case of Canada vs. Michigan Malleable Iron Co., 124 F. 486; 61 C. C. A. 194 (6th circ.) in which it was held that a patent is not void for anticipation because of prior publications or patents describing or claiming devices which might, in the light of the patented device, be so constructed as to be capable of the same use as described and contemplated for the patented device, where such prior descriptions give no hint of such use or change.

Claims 2 and 3 define a type of tube for supporting the main feed screw which is not shown by Clark and Church and differentiate from Bussells by defining a co-operation of the feed screws not disclosed by the latter. Bussells device contemplates the forcing of the material into the cylinder under pressure; and, if this structure were used for applicant's purpose, the very condition which the applicant has designed his structure to remedy would be aggravated, namely, the finely pulverized chalk would be forced down into the cylinder A under a pressure even greater than that which would be given it

by the weight of the material above it in the hopper,
if there were no force feed in the hopper L. This
pressure would force the material past the convolutions
of the coarse pitch screw and an irregular feed would
result.

Respectfully submitted,

THOMAS A. EDISON

By

J. K. Keir

His Attorney.

Orange, New Jersey,
November 19th 1910.

Div. 4 Room 232

2-280

Paper No. 11

Address only
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

SM-Cobb

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

Jan. 7, 1911.

Thomas A. Edison,

C/o Frank L. Dyer,

Edison Laboratory, Orange, N. J.



Please find below a communication from the *EXAMINER* in charge of your application.

Serial No. 299,484, filed Feb. 5, 1906, for Feeding Apparatus
for Cement Kilns.

E. B. Moore

Commissioner of Patents.

Case re-examined as amended Nov. 21, 1910.

The 5 claims do not differentiate over Church, 304,615,
of record, and are accordingly rejected. Moreover, every element
of applicant's device appears to be clearly shown in the Church
patent. The fact that other additional matter is there shown,
is, of course, immaterial. Applicant's device is not considered
patentable over this reference.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison
FEEDING APPARATUS FOR
CEMENT KILNS

Filed February 5, 1906

Serial No. 299,484

Room No. 232.

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office action of
January 7, 1911, please amend the above entitled applica-
tion as follows:-

Rewrite the claims as follows:-

1. Apparatus for feeding fine material into cement kilns, comprising a tube having an open end communicating with the kiln, a hopper having a passage communicating with said tube, an auxiliary fine pitch feed screw for uniformly removing material from said hopper, and a main coarse pitch feed screw mounted in said tube, the said feed screws having substantially the same capacity, substantially as described.

2. Apparatus for feeding fine material into cement kilns, comprising a tube having an open end communicating with the kiln, a hopper having a passage communicating with said tube, an auxiliary fine pitch feed screw for uniformly removing material from said hopper, a main coarse pitch feed screw mounted in said tube, the said feed screws hav-

ing substantially the same capacity, a driving shaft, and gearing for connecting the said feed screws to the driving shaft, substantially as described.

3. Apparatus for feeding fine material into cement kilns comprising a movable carriage, a tube having an open end adapted to communicate with the kiln, a hopper having a passage communicating with said tube, an auxiliary fine pitch feed screw for uniformly removing material from said hopper, a main coarse pitch feed screw mounted in said tube, the said feed screws having substantially the same capacity, a source of power, and gearing for connecting the said feed screws with the source of power, the said tube, hopper, screws, source of power and gearing being mounted on the movable carriage, substantially as described.

4. Apparatus for feeding fine material into cement kilns comprising a tube having an open end communicating with the kiln, a hopper having a passage communicating with said tube, an auxiliary fine pitch screw for removing material from said hopper at a uniform rate, and a main coarse pitch feed screw loosely mounted in said tube and receiving material delivered by said fine pitch screw, a driving shaft and gearing for rotating the feed screws at such speeds that the speed of the main screw will be slightly greater proportionately to the amount of material to be fed than that of the auxiliary screw, whereby loss in feeding capacity due to looseness of fit between the main feed screw and its containing tube is compensated for, substantially as described.

R E M A R K S

The claims have been rewritten after a careful consideration of the references. Claims 1, 2 and 3 differentiate clearly from Church, as well as from the other references of record by setting forth that the feed screws have substantially the same capacity. In Church the screw conveyor L has a capacity equal to the combined capacities of the screw conveyors B, H and M. In Bussells, the screw conveyor A has a much greater capacity than either of the other conveyors, as is evidenced by the statement in lines 15, et seq., page 2 of Bussells' specification in which it is stated that the fish or other material that is to be cooked will ordinarily not quite half fill the cylinder, but will extend along the bottom.

Neither Church nor any of the other references of record discloses that feature of applicant's invention which is set forth in Claim 4 relating to the means for driving the screws in such a manner that the loss in feeding capacity due to the looseness of fit between the main feed screw and its containing tube is compensated for.

As has been pointed out in previous arguments, the purpose of applicant's invention is entirely different from anything disclosed in the prior art, and it is believed that the claims in their present form differentiate from the patents of record to a sufficient extent to render them patentable.

Reconsideration and allowance are requested.

Respectfully submitted,

THOMAS A. EDISON

By

Frank L. Lyster

His Attorney

Orange, New Jersey

January 3rd, 1912.

Div. 4. Room 232

2-260

Paper No. 13

Address
"The Commissioner of Patents,
Washington, D. C."

SM-Cobb

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

Feb. 6, 1912.

Thomas A. Edison,

c/o Frank L. Dyer,

Edison Laboratory, Orange, N.J.

Please find below a communication from the EXAMINER in charge of your application.

Serial No. 299,484, filed Feb. 5, 1910, for Weeding Apparatus for
Cement Kilns.



Commissioner of Patents.

Case re-examined as amended Jan. 4, 1912.

The 4 claims are rejected on Church of record. M and the space above M constitute the hopper. M is the fine pitch conveyor, and L the main coarse pitch conveyor. By means of the belts and cone pulleys shown, it is perfectly clear that the ratio of the speeds of L and M can be so adjusted that the two have the same capacity. As to putting the thing on wheels, that is no substantial distinction. "Merely putting rollers under an article to make it movable, when without the rollers it would not be movable, does not involve patentable invention": Hendy v. Iron Works, 43, O.G.117.

As the claims do not differ substantially from those cancelled, the rejection is made final.



The Edison Portland Cement Co.

THOMAS A. EDISON, Chairman of Board
W. S. MALLORY, President
J. LESTER THOMPSON, Vice-President
H. F. MILLER, Treasurer
Wm. H. HOBBS, Sec'y and Asst. Treas.

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS, STEWARTSVILLE, N. J.

SALES OFFICES:
PHILADELPHIA, Pa., Arcade Building
NEW YORK, N. Y., 31, Jersey Building
NEWARK, N. J., St. James Bldg., N. Y.
BOSTON, MASS., Post Office Square Bldg.

Jan. 30, 1913. MS

Legal Department,

Thomas A. Edison, Inc.,

Orange, N. J.

Attention Mr. Henry Lanahan.

Dear Sir:-

Your letter of January 23rd, in regard to Mr. Edison's application, Serial No. 299,464, has been referred to the writer. In reply would advise that we have abandoned this type of feed for the kilns, for it is not sufficiently accurate, although a large improvement on former types, and I do not think we would be warranted in spending much money in prosecuting the application of the patent.

Yours very truly,

THE EDISON PORTLAND CEMENT COMPANY,

W. S. Mallory
Superintendent.

P.S. Am returning all data in re above application under separate cover.

Set forth loose fit
(H) and conveyor driven to
compensate for same. (similar
to 2)

(1) 2 screws of sub. same
Capacity.

(2) ~~2~~ ditto + ~~gear~~ gearing -

(3) ditto + movable carriage.
SMITH

Folio No. 226Serial No. 306,781

Applicant.

Thos. A. Edison

Address.

Orange, N. J.

Title

Process of Electroplating

Filed

Mar. 19, 1906

Examiner's Room No.

175

Assignee.

Thomas A. Edison, Inc.

Ass'g't Exec.

June 30, 1916

Recorded

July 7, 1916

Liber

7127

Page

52

Patent No.

464,096

Issued

July 12, 1910

ACTIONS.

1. Rejected May 5, 1906 16.
2. Amended April 11, 1907 17.
3. Rejected May 14, 1907 18.
4. Amended June 26, 1907 19.
5. Rejection August 13, 1907 20.
6. Rejected December 21, 1907 21.
7. Amended December 17, 1908 22.
8. Rejected December 31, 1908 23.
9. Amended Dec. 28, 1909 24.
10. Allowed Jan. 13, 1910 25.
11. Final Order July 13, 1910 26.
12. " " July 15, 1910 27.
13. _____ 28.
14. _____ 29.
15. _____ 30.

FRANK L. DYER,

Counsel,

Orange, New Jersey.

Dyer -

Is there another application
describing making of multiple film sheets
of Co Ni Co Ni etc - should you not
describe in this application that
after the chemically deposited Copper +
Electrolytically deposited Copper is
made, it can then be washed & put
in a Cobalt plating solution ~~where~~
~~no more change~~ & plated with
Cobalt then washed & put in
Copper solution & immediately
connection with the current to prevent
any material reduction of the Copper
by the Cobalt & this is continued
several times until quite a thick
sheet is obtained this is then cut
& stripped from the drum,
the original chain is only deposited
Copper not adhering in the
slightest to the smooth Nickel
Cathode = C Chain this

5

Feb 6 1906 -

Received
Feb 8/1906
Grant & Son

Invention consists in improvement in electroplating solutions consisting more homogeneous metal is deposited out of the solution, having its occluded hydrogen very much reduced, which allows favorably the quality of the metal making it less brittle & permeable free of pores, also preventing the formation of hydrogen gas bubbles which cling to the deposited metal resulting in a warty surface, & incidentally permitting of a high rate of deposit with less quality than is otherwise possible - It also prevents striking deposits

The invention consists in keeping in the bath a small quantity of free Chlorine which combining with the hydrogen prevents the formation of metallic hydrides or absorption of the gas - & also prevents the formation

of microscopic bubbles of hydrogen clinging to the surface. The Chlorine combining with the hydrogen to form Hydrochloric acid. There are probably other favorable reactions brought about by the presence of free Chlorine.

The Chlorine may be added to the bath by passing the gas through it or adding water saturated with Chlorine or a portion of the electrolyte saturated with Chlorine.

For instance if Sulphate of Copper is used for plating Copper the Chlorine can be added by chlorinating some of the Copper Sulphate separately & adding a little from time to time. The solution should be slightly acid, the effect of the Chlorine lasts several hours, when a fresh quantity must

be added, there is very little loss
of Chlorine by its combination with
the anode or Cathode.
Bromine ~~is not~~ does not act as well
as Chlorine.

Chlorine the use of free Chlorine
in Electrolytic depositing baths
for producing homogeneous deposits
~~for depositing~~

703

Folio No. 227Serial No. 306,782

Applicant.

Thos. A. Edison

Address.

Orange, N. J.Title Process of ElectroplatingFiled Mar. 19, 1906Examiner's Room No. 175

Assignee

Ass't Exec.

Recorded

Liber.

Page

Patent No.

Issued

ACTIONS.

- | | |
|------------------------------------|--|
| 1. <u>Rejection May 5, 1906</u> | 16. <u>It was found that same</u> |
| 2. <u>Amended April 9, 1907</u> | 17. <u>invention was covered by</u> |
| 3. <u>Rejections May 14, 1907</u> | 18. <u>case 288 (filed Jan 19/07 -</u> |
| 4. <u>Amended July 3, 1907</u> | 19. <u>as 353061), the latter having</u> |
| 5. <u>Rejection August 3, 1907</u> | 20. <u>a more complete species. All</u> |
| 6. _____ | 21. <u>allowable claims were therefore</u> |
| 7. _____ | 22. <u>withdrawn from this case, and</u> |
| 8. _____ | 23. <u>introduced in #288, which</u> |
| 9. _____ | 24. <u>Thompson issued Sept 11/07</u> |
| 10. _____ | 25. <u>#865688. Strikingly</u> |
| 11. _____ | 26. <u>in this case. Allow to issue</u> |
| 12. _____ | 27. <u>abandoned.</u> |
| 13. _____ | 28. <u>S. L. D.</u> |
| 14. _____ | 29. <u>Oct 15/07</u> |
| 15. _____ | 30. _____ |

FRANK L. DYER,

Counsel,

Orange, New Jersey.

1.
Received
Feb 8/1906
Gunn & Son

The object of this invention is to produce sheets of metal electrolytically -

The invention consists in providing a sheet or preferably a drum which can be rotated in the electrolytic bath ~~and~~ the surface of which is metal plated by the solution such as Nickel or Cobalt or Copper solution. -

Upon this drum is plated an extremely thin coating of a metal which reduces Copper from to metal by immersion only in a Copper salt, such a Cobalt. - The film of Cobalt plated over the Nickel surface is washed with water & then immersed in a solution of Sulphate of Copper for several seconds to whereby the Cobalt is dissolved & metallic Copper takes its place. - The drum is again washed

2

and put in a Copper plating bath
and the sheet made thicker by
electrolytic deposit. The sheet
can be detached by cutting it in
parallel with the drum. This deposit
does not in the least stick to the
Nickel surface, as there is no tendency
for metals deposited chemically to
adhere, only those produced electrolytically.
I am thus enabled to form
articles in various shapes which
are easily detached. ^{Time} From can be used
but the action of Zinc is so rapid that
the Copper deposited is black and
porous while iron with slow depositing
the Copper in bright form of too porous
irregular. Cobalt ^{with} the
deposit is perfectly ^{smooth} and
The deposit of Cobalt need not exceed
one one hundred thousandth of an
inch. The Nickel surface is

3

not affected by the Copper
solution, from which it is in fact
deposited. The process is
superior to the one described in
my application filed hereto.

Claim - A method of electroplating
deposits substances

A nickel ~~plating~~ Cathode ~~on~~
containing a metallic deposit
thereon obtained chemically ~~over~~ upon
which metal is plated Electrolytically

A ~~metallic~~ ~~surface~~ Cathode not
affected by the electrolyte having
plated upon it an extremely thin
film of a metal which reduces metals
from their salts chemically, upon which

4

Metals may be plated electrolytically
so as to permit easy detachment.

Use Nickel with a reducing
film Cabot for cleaning
Copper over which the Nickel
or Metals required are plated
Electrolytically.

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS ALVA EDISON,
a citizen of the United States, residing at Llewellyn
Park, Orange, County of Essex and State of New Jersey,
have invented a certain new and useful PROCESS OF ELEC-
TROPLATING, of which the following is a description:-

In carrying on experimental and commercial
operations in connection with electroplating, I find that
the occlusion of hydrogen tends to make the deposit
somewhat brittle and more or less porous, and that hy-
drogen gas clings to the surfaces of the deposited metal
in the form of very fine bubbles, thereby making the
surfaces more or less warty and rough. The presence of
occluded hydrogen, as well as of the hydrogen bubbles
referred to, prevents the deposition at a high rate, and
also results in streaky and uneven deposits. My object
is to provide an improved process of electroplating, where-
by I very largely eliminate the occlusion of hydrogen,
as well as the formation of hydrogen bubbles on the de-
posited surfaces, and in consequence I am enabled to
carry on a plating operation at a much higher rate than
is now possible, and at the same time with ^{the} production
of a better quality of deposit, less brittle in charac-
ter, practically free of pores, and with a smooth and uni-
form surface. The invention resides in the fact that
by maintaining in the plating bath a small quantity of

In the case of a Chloride Bath as for instance Chloride of Cobalt a platinum or Cadmium anode of very small surface area is connected to the solution in the bath & made to communicate with the solution

free chlorine, the latter will combine with any hydrogen set free by the electrolytic action, or otherwise, thereby preventing the formation of metallic hydrates as well as the occlusion of the gas, and eliminating also the appearance of microscopic bubbles thereof, which cling to the deposited surfaces with the objections pointed out. When free chlorine is thus present in the bath, it combines with any hydrogen generated therein to form hydrochloric acid, although it is possible that other favorable reactions may be brought about by the presence of free chlorine.

The chlorine may be added to the plating bath in any suitable way, such, for example, as by passing the gas continuously, or at suitable intervals, through the bath; by adding to the bath, water saturated with chlorine, or by adding from time to time fresh quantities of the electrolyte saturated with chlorine. For instance, if copper is to be plated from a solution of sulphate of copper, the chlorine can be added by chlorinating a suitable quantity of the solution, which can be added from time to time in small amounts to the solution as the chlorine becomes exhausted. In practice the solution should have a slightly acid reaction. I find that the effect of the chlorine thus introduced into the bath lasts for several hours, when a fresh quantity must be added. Practically all of the chlorine is utilized in combining with the hydrogen developed, there being very little loss of chlorine by its combination with either the anode or cathode. Free bromine may also be employed, but with results that are far inferior to those secured when chlorine

is used. The use of Chlorine in Cobalt plating baths is especially important, making a much better solution than Cobalt Chloride solution are used.

1. The process of electroplating, which consists in chemically depositing a metal on a suitable cathode and in electroplating a metal on the deposit so formed, substantially as and for the purposes set forth.

2. A process of electroplating, which consists in chemically depositing a metal on a suitable cathode, and in electrolytically depositing the same metal on the deposit so formed, substantially as and for the purposes set forth.

3. The process of electroplating, which consists in electroplating a thin metallic film on a suitable cathode, in chemically converting said film into a deposit of another metal, and in electroplating a metal on the chemically deposited film so formed, substantially as set forth.

4. The process of electroplating, which consists in electrolytically depositing a metallic film on a suitable cathode, in immersing the cathode with its deposit in a solution of a metallic salt, capable of reduction by the electrolytically deposited metal, whereby the latter will be dissolved and replaced by metal chemically deposited from said solution, and in finally electroplating on the chemical deposit so secured, substantially as set forth.

5. The process of electroplating, which consists in electroplating on a suitable cathode a film of a metal capable of reducing copper from a solution thereof, then

in immersing the cathode with its deposit in a solution of copper, whereby the electro-deposited metal will be dissolved and replaced by a chemical deposit of copper, and finally in electroplating upon the chemically deposited film of copper, substantially as and for the purposes set forth.

6. The process of electroplating, which consists in electroplating on a suitable cathode a film of a metal capable of reducing copper from the sulphate thereof, then in immersing the cathode with its deposited metal in a solution of sulphate of copper, whereby the electro-deposited metal will be dissolved and replaced by a film of chemically deposited copper, and finally in electroplating upon the copper deposit so secured, substantially as set forth.

7. The process of electroplating, which consists in depositing a film of cobalt on a suitable cathode, then in immersing the cathode with the deposited film thereon in ^{the} a copper solution, whereby cobalt will be dissolved and replaced by a chemical deposit of metallic copper, and finally in electroplating upon the chemically-deposited copper film, substantially as and for the purposes set forth.

8. The process of electroplating, which consists in electroplating a film of cobalt on a suitable cathode, then in immersing the cathode with its deposited film in a solution of sulphate of copper, whereby the cobalt

will be dissolved and replaced by a chemical deposit of metallic copper, and finally in electroplating on the chemically deposited copper film, substantially as and for the purposes set forth.

226-227

March 17, 1906

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

Enclosed I hand you herewith, two specifications
in the name of Thomas A. Edison, one for a PROCESS OF
ELECTROPLATING and another for a PROCESS OF ELECTROPLATING,
(no drawings), together with a check for thirty dollars
(\$30.) in payment for the first government fees.

Kindly acknowledge receipt.

Very respectfully,

Enclosure

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Petition.

To the Commissioner of Patents :

Your Petitioner THOMAS ALVA EDISON ,
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, County of Essex and State of New Jersey

prays that letters patent may be granted to him for the improvements in

PROCESS OF KINEMATOGRAPHING,

set forth in the annexed specification ; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Edison Laboratory, Orange, New Jersey, his
attorney, with full power of substitution and revocation, to prosecute this
application, to make alterations and amendments therein, to receive the patent,
and to transact all business in the Patent Office connected therewith.

Thos A. Edison

-S P E C I F I C A T I O N-

TO ALL WHOM IT MAY CONCERN:

Be it known, that I, THOMAS ALVA EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, County of Essex and State of New Jersey, have invented a certain new and useful improvement in PROCESS OF ELECTROPLATING, of which the following is a description:-

My invention relates to an improved process of electroplating, and my object is to provide a process for the purpose in which the deposit will be very uniform, perfect, coherent, and non-porous, and at the same time can be cleanly and freely removed from the cathode on which it takes place. My improved process is susceptible of convenient use in any connection where it is important that a very perfect deposit should be made and then stripped cleanly from the cathode, but I have devised and successfully utilized the same in connection with the manufacture of metallic flakes for use with my improved storage batteries. Broadly stated, the invention consists in forming on a suitable cathode, an exceedingly thin film of a chemically deposited metal, and in then plating electrolytically thereon the metal desired, the presence of the film of chemically deposited metal between the cathode and the electrodeposited metal permitting the ready and clean detachment of the latter, since the former has no tendency to adhere

tenaciously to the cathode, as is the case with an electrodeposited metal. Preferably, the chemically deposited film is the same metal as that which is electrolytically deposited thereon. The formation of the chemically deposited metallic film can be effected in any suitable way, but it is preferably secured by first electroplating on the cathode a suitable metal, such as cobalt, which reduces another metal such as copper, from a salt thereof, by immersion. The following is an example of a convenient manner of carrying the process into effect, assuming that a deposit of copper is to be made electrolytically.

I make use of a suitable cathode, either in the form of a plate or drum, having a surface which will not be affected by the solution employed. In the specific example to be described, dealing with cobalt and copper solutions, this cathode may be formed of nickel, or be provided with a nickel surface. The surface on which the deposit takes place should be as smooth as possible. Upon this cathode I now plate electrolytically, in the usual way, an extremely thin film of cobalt. This deposit need not be greater than one one-hundred-thousandth of an inch in thickness. The cathode is now washed with water and is then immersed in a solution of sulphate of copper for several seconds, whereby the cobalt ^{is} dissolved and is replaced by metallic copper. This copper deposit thus secured is very bright, uniform and coherent. The cathode is again washed, and a coating of copper of the desired thickness is deposited thereon electrolytically, in the usual way. When the deposit takes place on a cathode in the form of a drum, as is preferable, it may be removed by cutting the sheet

longitudinally, after which it may be readily stripped off. In this way I am enabled to form not only sheets, but other articles of various shapes electrolytically, which may be readily detached from the cathodes. When the process is used for the production of cobalt films, as I describe, for example, in my application for Letters Patent filed December 5th, 1905, Serial No. 290,336, after the electrolytically deposited film of cobalt has been formed, the latter is washed and the cathode immersed in a bath containing a suitable cobalt solution with cobalt anodes and a film of cobalt of the desired thickness plated thereon. After washing, the cathode with the deposited films, is introduced again in the copper bath, and plated with a copper film, the connection being made immediately with the current to prevent any material reduction of the copper by the deposit of cobalt. These operations are continued, alternating films of copper and cobalt being formed until a sheet of the desired thickness is obtained, which is then cut longitudinally and removed from the drum. Such a sheet may be then cut up into pieces of desired size and subjected to a suitable treatment by which the copper will be dissolved, leaving the flakes of cobalt intact, as I describe in said application.

Instead of using cobalt as the metal for the reduction of copper from its salt, other metals might be used, such as zinc or iron. I find, however, that when zinc is used, it reduces the copper so rapidly that the deposit is black and porous, and hence objectionable when highly homogeneous, coherent and uniform articles are to be produced. When iron is used, the chemical deposit of copper is bright, but it is more or less porous

and irregular, and therefore also objectionable. Cobalt is in every way the most desirable metal for the purpose that I have discovered, since by its use the deposit of copper is perfectly smooth, uniform and coherent. In performing the preliminary electroplating process, as well as in plating the desired deposit on the chemically formed film, I preferably maintain free chlorine in the cobalt and copper solutions, as I am thereby enabled to secure a more rapid and uniform deposit, as I describe in my application for Letters Patent ^{4/19/01} filed on even date herewith.

Having now described my invention, what I claim as now and desire to secure by Letters Patent is as follows:-

1. The process of electroplating, which consists in chemically depositing a metal on a suitable cathode ^{and subsequently removing the said deposit from the cathode} and in electroplating a metal on the deposit so formed, ^{4/19/01} substantially as and for the purposes set forth.

2. A process of electroplating, which consists in chemically depositing a metal on a suitable cathode, and in electrolytically depositing the same metal on the said ^{and mechanically removing the said deposit from the cathode} deposit so formed, substantially as and for the purposes set forth. ^{4/19/01}

Insert "A" claim in 3rd col.
3. The process of electroplating, which consists in electroplating a thin metallic film on a suitable cathode, in chemically converting said film into a deposit of another metal, and in electroplating a metal on the chemically deposited film so formed, substantially as set forth.

4. The process of electroplating, which consists in electrolytically depositing a metallic film on a suit-

able cathode, in immersing the cathode with its deposit in a solution of a metallic salt, capable of reduction by the electrolytically deposited metal, whereby the latter will be dissolved and replaced by metal chemically deposited from said solution, and in finally electroplating on the chemical deposit so secured, substantially as set forth.

=75. The process of electroplating, which consists in electroplating on a suitable cathode a film of a metal capable of reducing copper from a solution thereof, then in immersing the cathode with its deposit in a solution of copper, whereby the electrodeposited metal will be dissolved and replaced by a chemical deposit of copper, and finally, in electroplating upon the chemically deposited film of copper, substantially as set forth.

=76. The process of electroplating, which consists in electroplating on a suitable cathode a film of a metal capable of reducing copper from the sulphate thereof, then in immersing the cathode with its deposited metal in a solution of sulphate of copper, whereby the electrodeposited metal will be dissolved and replaced by a film of chemically deposited copper, and finally, in electroplating upon the copper deposit so secured, substantially as and for the purposes set forth.

=77. The process of electroplating, which consists in depositing a film of cobalt on a suitable cathode, then in immersing the cathode with the deposited film thereon, in a copper solution, whereby the cobalt will be dissolved and replaced by a chemical deposit of metallic copper, and finally in electroplating upon the chemically deposited copper film, substantially as set forth.

Revised July 3, 1904

10-8. The process of electroplating, which consists in electroplating a film of cobalt on a suitable cathode, then in immersing the cathode with its deposited film in a solution of sulphate of copper, whereby the cobalt will be dissolved and replaced by a chemical deposit of metallic copper, and finally, in electroplating on the chemically deposited copper film, substantially as and for the purposes set forth.

*Approved
July 13, 1904.*

This specification signed and witnessed this 17 day of Mar 1906

Thos A Edison

Witnesses:

1. Am R Allen
2. Frank Dwyer

Oath.

State of New Jersey }
County of Essex ss.,

THOMAS ALVA EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Orange, County of Essex and State of New Jersey,

that he verily believes himself to be the original, first and sole inventor of the improvements in PROCESS OF KINETOGRAPHING,

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 17 day of Mar 1906

Thos A Edison

Frank Dwyer

Notary Public.

(Seal)

2-260.

Div. Room 175.
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

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Paper No. 2
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

May 5, 1906.

Thomas A. Edison,

c/o Frank L. Dyer,

Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

Ser. No. 306,762, filed March 19, 1906:-

"Process of Electroplating."

F. L. Allen
Commissioner of Patents.

Page 1, line 14, the words "very perfect" should be revised.

The serial number, 306,761, should be supplied in line 11 of
page 4.

Claim 1 is rejected upon each of:

581,775, May 4, 1897, Schwabe, Ag. Bath, Multiple,
505,576, Sep. 26, 1903, Scharling, " " "
446,590, Feb. 17, 1891, Spraggon, " " "

Claim 2 is rejected upon Scharling.

The remaining claims appear to be allowable.

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UNITED STATES PATENT OFFICE.

Thomas A. Edison)
PROCESS OF ELECTROPLATING)
Filed March 19, 1906) Room No. 175
Serial No. 306,782)

HONORABLE COMMISSIONER OF PATENTS,

S I R :--

Replying to Office action
of May 5th, 1906, please amend the above entitled case as
follows:

Cancel "and" the first word in line 3 of claim 1;
at the end of the same line insert - and mechanically
removing the said deposits from the cathode -.

Claim 2, line 3, cancel "and"; line 4, after
"formed" insert - and mechanically removing the said
deposits from the cathode -.

Insert as claims 3 and 4 the following:

a 3. The process of electroplating which consists
in replacing the metal at the surface of a suitable metallic
cathode with another metal by treating the cathode with a
solution of a salt of the said metal and in electroplating
a metal on the deposit so formed, substantially as set
forth.

4. The process of electroplating which consists
in replacing the metal at the surface of a suitable metallic
cathode with another metal by treating it with a salt of
the said second metal and in further electrolytically

depositing the said second metal upon the deposit so formed, substantially as set forth.

Renumber claims 3, 4, 5, 6, 7 and 8 as 5, 6, 7, 8, 9 and 10.

R E M A R K S

Claims 1 and 2, while not thought to have been anticipated by the references, for the reason that a glass dish cannot properly be termed a cathode, have been amended to more clearly bring out the invention.

Claims 3 and 4 herein presented appear to be patentable over the cited art. An allowance is requested.

THOMAS A. EDISON

By Rauch & Dyer

His Attorney.

Orange, New Jersey

April 9 1907.

DIV. 3 Room 175
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-260.

Paper No. 3
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

R.A.J.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

Thomas A. Edison,

C/o Frank L. Dyer,

Orange, New Jersey,

May 14, 1907.



Please find below a communication from the EXAMINER in charge of your application,
306,782, filed Mar. 19, 1906, for Process of Electroplating.

D. I. Allen
Commissioner of Patents.

Replying to amendment of Apl. 10, 1907.

The serial number 306,781, should be inserted in line
10, page 4.

Claims 3 and 4 are rejected upon---

✓ 82,525, Sep. 29 1868, Jacobi, Aqueous Bath, and
561,775, May 4, 1897, Schwabe, " " Multiple.

The remaining claims appear to be ready for allowance.

Examiner, D1 V/3.

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,
Process of Electroplating,)
Filed March 19, 1906,) Room No. 175.
Serial No. 306,782.

HONORABLE COMMISSIONER OF PATENTS,

S I R : -

Applicant has just discovered that his application filed January 19th, 1907, Serial No. 353,061 for Process of Making Metallic Films or Flakes is practically identical with the present case. The error, no doubt, arose because of the large number of cases which had been filed relating generally to this subject. Applicant finds that all the claims of the present case are capable of being made in the second application, and since the specification of the second application is more full than that of the present case, those claims of the present case which have been allowed will be inserted in the second application, and this has been done today. In order that there may not be two applications pending at the same time with the same claims, applicant therefore amends the present case by erasing claims 1, 2, 5, 6, 7, 8, 9, and 10. Claims 3 and 4 have not been erased because they stand under rejection. When the patent on the second case issues, the present case will be abandoned if the Examiner wishes to have that done.

Very respectfully,
THOMAS A. EDISON,

Orange, New Jersey,
July 3d, 1907.

By

Grand L. Dyke
His attorney.

Div. 3 Room 175
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-360.

Paper No. 5

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,

R.A.J.

UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

Aug. 3, 1907.

Thomas A. Edison,

C/o Frank L. Dyer,

Orange, N.J.



Please find below a communication from the EXAMINER in charge of your application,

306,782/ filed Mar. 19, 1906:---

Process of Electroplating.

E. B. Moore

Commissioner of Patents.

Replying to amendment filed July 5, 1907:---

Claims 1 and 2 remain under rejection on the references
cited thereto.

Examiner, Division 3.

Folio No. 234Serial No. 315717

Applicant.

Thos. A. Edison

Address.

Orange N.J.

Title

Manufacture of Portland Cement

Filed

May 8 1906Examiner's Room No. 300

Assignee

Thomas A. Edison, Inc.Successors in the Edison nameAss't Exec. June 30, 1916 Recorded July 7, 1916 Liber. 7127 Page 50Patent No. 1059661Issued April 22, 1913

ACTIONS.

- | | |
|---|-------------------------------------|
| 1 <u>Registered July 26, 1906</u> | 16 <u>Final fee due Sep. 9-1913</u> |
| 2 <u>Reexamination requested June 26/1907</u> | 17 |
| 3 <u>Rejected July 15, 1907</u> | 18 <u>No foreign applica-</u> |
| 4 <u>Amended July 13, 1908</u> | 19 <u>tions</u> |
| 5 <u>Registered Sept. 8, 1908</u> | 20 <u>To issue in the Edison</u> |
| 6 <u>Amended Sept. 4, 1909</u> | 21 <u>name</u> |
| 7 <u>Rejection Oct. 11, 1909</u> | 22 |
| 8 <u>Amended Oct. 7, 1910</u> | 23 |
| 9 <u>Rejected Nov. 17, 1910</u> | 24 |
| 10 <u>Amended Nov. 9, 1911</u> | 25 |
| 11 <u>Rejected Dec. 13, 1911</u> | 26 |
| 12 <u>Request for explanation Dec. 21, 1911</u> | 27 |
| 13 <u>Rejected Feb. 8, 1912</u> | 28 |
| 14 <u>Amended Dec. 10-1912</u> | 29 |
| 15 <u>Allowed March 3-1913</u> | 30 |

VAULT

FRANK L. DYER,

Counsel,

Orange, New Jersey.

*File in
answer*

-SPECIFICATION-

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States, ~~and~~ residing at Llewellyn Park, Orange, County of Essex and State of New Jersey, have invented certain new and useful improvements in the MANUFACTURE OF PORTLAND CEMENT, of which the following is a description:-

My invention relates to an improved process for manufacturing Portland Cement and my object is the production of a process for the purpose which can be economically and effectively practiced in localities where the conditions as to raw material are unfavorable for working by present methods. In general, the invention consists in manufacturing artificially a cement making material similar in its chemical and physical properties to the best natural cement rock, as found, for example in eastern Pennsylvania and ^{South} north-western New Jersey; said material being subsequently admixed with a proper proportion of limestone, and, after grinding, being burned in a cement kiln, as in modern cement-making processes. Broadly speaking, the invention consists in forming a cement making material or natural cement rock, (adapted to be intimately mixed with the proper proportion of limestone to result, after calcination, in the production of Portland cement) by slagging or fusing the correct proportions of silicious material, such as quartz, with a sufficiently low percentage of limestone, ~~as~~ in the presence of alumina (for instance clay) and iron, ^{so as to thereby} ~~to~~ ^{to} ~~such result~~.

such fusion taking place
into a very fluid slag_A in a suitable water-jacketed furnace for the purpose, the fluid slag being tapped off at the bottom of the furnace and being finally sub~~divided~~^{divided} or disintegrated, for instance, by a powerful jet of compressed air or steam, or by centrifugal force. I find that it is possible to artificially make cement rock in this way at a sufficiently low temperature to enable ~~the~~^{the} process to be carried on in an economical, and on an entirely practical scale, so that when the material is intimately added to finely powdered limestone and burned in a rotary kiln or otherwise, Portland cement of excellent quality can be secured. While it would be possible to intimately mix proper proportions of raw materials (silica, alumina, iron and lime) as to result in Portland cement after burning in a rotary kiln, the expense of fine grinding the silicious ingredients, such as quartz, would more than offset the ~~cost~~^{cost} of the slagging operation which is therefore preferred. I am of course aware that heretofore ~~it has been~~^{they have made} proposed to make Portland cement from slag obtained in the operation of blast furnaces, but with these latter processes, the slag is seldom suitable for the purpose and generally contains sulphur or other objectionable impurities, and even when the slag is capable of use for ~~the~~^{the} purpose, the resulting cement is very irregular in quality, and ~~generally~~^{generally} ~~lacking in hydraulic properties.~~ With my improved process, the slag, instead of being an irregular and uncertain by-product, is the direct product of the operation

and hence the ingredients can be always selected so as to result in a perfect material free from objectionable impurities. The important consideration in the process is the use of a sufficiently low percentage of lime as to enable the slagging operation to be carried on at an economical temperature, while at the same time the resulting slag can be made extremely liquid and non-viscid, and hence can be readily blown or disintegrated into a fine powder. If it were attempted to add a sufficient amount of lime in the first instance to make Portland cement, the temperature required for its fusion would be far too high to enable the operations to be carried on with any degree of commercial economy. In order that the invention may be better understood, attention is directed to the accompanying drawing, forming part of this specification, and in which -

Figure 1, is a diagrammatic view of a water-jacketed furnace and settling chamber, illustrating the disintegration of the fluid slag by a blast of compressed air or steam, and

Figure 2, a similar view illustrating the disintegration of the fluid slag by centrifugal force.

Similar parts are represented by the same numerals of reference.

In carrying the invention into effect, I introduce into the furnace 1, successive charges of cement making material, to which ~~are~~ added coal or coke in the proper amount to effect the fusion. Quartz may be employed as the source of silica, and clay as the source of alumina.

A small percentage of oxide of iron is also employed, as well as limestone, in sufficient amount to permit fusion at an economically low temperature. Suitable proportions are the following, which are given as an example

only, and may be considerably varied, depending on the price of ^{these} materials. Many natural materials have considerable quantities of Pulver which increase the fusibility of the slag.

Quartz	-	pounds, SiO ₂	32 %
Clay	-	" CaO	50
Iron	-	" Fe ₂ O ₃	13
Limestone	-	" Mg	5
			<hr/> 100

Containing these substances
These materials are broken up into lumps, ranging preferably from ¹/₄ inch to 1 inch in diameter, and are fed to the furnace with the proper amount of extraneous materials intimately mixed with the coal or coke before being introduced into the furnace. The furnace is provided with a water jacket 2, by which its walls will be kept at a comparatively low temperature, so as to cause an accumulation of slag to collect on the interior and thereby effectively prevent the same from burning out. As the material fuses the very liquid slag is tapped off through a valved pipe 3. The liquid, as it falls may be subjected to the effect of a powerful blast of compressed air or steam from a pipe 4, by which the liquid will be finely sub-divided and blown into a large settling chamber 5, so as to deposit therein as a fine powder. Instead of subdividing the liquid slag by a jet, as explained, it may be allowed to fall on a rapidly rotating wheel 6, by which it will be thrown off by centrifugal force into the settling chamber 5, and finely sub-divided in this way. The fine powder deposited in the settling chamber is now in-

OK

timately admixed with the proper proportion of powdered limestone to bring the lime contents up to the desired formula for Portland cement and the chalk ^{like compound} thus secured is then clinkered in a suitable rotary cement kiln, or otherwise. If desired, the material collected in the settling chamber, if not sufficiently fine and uniform, may be first ground and properly sized by screening or blowing, after which it may be then mixed with the powdered limestone.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is as follows:

1. The process of making artificial cement rock, adapted for use in the manufacture of Portland cement, which consists in fusing the proper proportions of ingredients to a very fluid slag, requiring only the addition of limestone and calcination for the production of Portland cement, substantially as set forth.

2. The process of making an artificial cement rock adapted for use in the manufacture of Portland cement, which consists in combining with silicious and aluminous materials sufficient lime to permit a very fluid slag to be obtained, and in then fusing such materials for the production of such slag, substantially as set forth.

3. The process of making an artificial cement rock adapted for use in the manufacture of Portland cement which consists in combining with silicious and aluminous materials sufficient lime to permit a very fluid slag to

be obtained, ~~xxx~~ in then fusing such materials for the production of such slag, and in finally ^{consolidating and} reducing the fluid slag to a finely pulverulent condition, substantially as set forth.

4. The process of making an artificial cement rock adapted for use in the manufacture of Portland cement, which consists in combining with silicious and aluminous materials sufficient lime to permit a very fluid slag to be obtained, in then fusing such materials for the production of such slag, and in finally ~~consolidating and~~ subjecting the fluid slag to a blast of compressed air or steam by which it will be disintegrated and reduced to a finely pulverulent condition, substantially as set forth.

5. The process of making an artificial cement rock adapted for use in the manufacture of Portland cement, which consists in combining with silicious and aluminous materials sufficient lime to permit a very fluid slag to be obtained, in then fusing such materials for the production of such slag, in reducing the fluid slag to a finely pulverulent condition, in adding to the pulverulent slag so obtained a sufficient quantity of lime to produce portland Cement, and in finally burning the mixture so secured, substantially as and for the purposes set forth.

2nd

Cancel the claims and substitute

1. The process of manufacturing Portland cement which consists in fusing ^{pre-determined} proper proportions of silicious and aluminous materials with only enough limestone to result in the production of a very fluid slag of substantially fixed proportions, in then finely subdividing the same, in then adding ^{surface additional} necessary limestone to complete the desired ^{final} proportion thereof, and in finally calcining the mixture, substantially as set forth. *to form a Portland cement clinker*

2. The process of manufacturing Portland cement, which consists in fusing proper proportions of silicious and aluminous materials with only enough limestone to result in the production of a very fluid slag of substantially fixed proportions, in subjecting the fluid slag to a powerful blast, whereby it will be chilled, and finely subdivided, ~~substantially as set forth~~, in then adding ^{sufficient} ~~necessary~~ limestone to complete the desired ^{proper} proportion thereof, and in finally calcining the mixture, substantially as set forth. *from the slag and added limestone to form Portland cement clinker*

Remarks

The claims have been redrawn in view of the references and are thought to be clearly allowable. *Recomm.*

Respectfully,

Thos. A. Edison
by his atty *Geo*



The Edison Portland Cement Co.

THOMAS A. EDISON, Chairman of Board
W. S. MALLORY, President
J. EDISON THOMPSON, Vice President
H. P. MILLER, Treasurer
Wm. H. HERRICK, Sec'y and Asst. Treas.

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS, STEWARTSVILLE, N. J.

SALES OFFICES:
PHILADELPHIA, PA., Arcade Building
NEW YORK, N. Y., 55 Jones Building
NEWARK, N. J., Union Building
BOSTON, MASS., East Office-County Bldg.
SAVANNAH, GA., National Bank Building

October 30, 1911.

Henry Lanahan, Esq.,

Edison Laboratory,

Orange, N. J.

Dear Sir:-

On reviewing the enclosed patents and rejection of pending application, it seems to me that the early rejections were based upon a failure in the Patent Office to appreciate the distinction between limestone, lime, or quick lime and hydrated lime. Their later action does not disclose that they make any distinction, hence it appears to me that if you can reopen the entire thing and go back and refute their original claims, it will put us in better shape.

To make it clear, will say limestone as it exists in nature is a more or less impure carbonate of lime. That is, it consists of lime represented by CaO and carbonic anhydride (carbon dioxide or commonly referred to as carbonic acid) represented by CO_2 . This material is unacted upon by water except to be dissolved very slightly as a carbonate without changing its composition.

To convert limestone into lime a distinct process is necessary; that is, it must be heated to a temperature of 1100 deg. F. to 1900 deg. F., which dissociates

the carbonate into lime (CaO) and carbon dioxide (CO_2), which latter goes off as a gas, leaving the lime which is very essentially different in its properties from limestone. This difference must be borne in mind.

Next - Hydrate of lime is essentially a very different compound than lime, inasmuch as to produce it another distinct operation is necessary. That is, we must add water in some form to lime (CaO) to produce hydrate of lime, which is lime and water, or CaO plus H_2O , or commonly written $\text{Ca}(\text{OH})_2$. This compound again differs in its properties from lime.

With these thoughts in mind we can refer to Patent Office action of July 26th, 1905. Their claims here are based on Bodmer patent. This we ought to try to dispose of on the following grounds: Bodmer specifically states "lime in its unslaked state, or in the form of hydrate", etc. This necessitates one distinct process to make the lime and another distinct process to slake it if he uses hydrate of lime. Edison uses limestone; that is, carbonate of lime and eliminates both these processes on this point. Carbonate of lime added to a slag, or scoria, as mentioned by Bodmer, will not produce a compound having any hydraulic properties other than that possessed by the slag alone, but on the other hand, any such properties which it does possess are weakened by the addition of carbonate of

lime. There is no similarity between Edison's use of carbonate of lime and Bodmer's use of lime or hydrate of lime, and the Patent Office must be made to understand this radical difference. We do not contend that Bodmer does not produce a hydraulic cement, but we do claim that it is in no sense a true Portland cement. Bodmer makes no claim to a true Portland cement, nor can it be read into his patent unless the Patent Office wishes to construe his subsequent vague statements, with or without subjecting to heat to mean that it must be subjected to sufficient heat to cause it to sinter. There is nothing in his patent to warrant it. There is nothing to show that he appreciated the fact that certain slag finely divided and mixed with lime will make an entirely different product than those same slag finely divided - mixed with lime - heated to incipient fusion or further and then reground. The latter, if of proper composition is a true Portland cement. The former in no sense of the word is such a compound. The fact that he claims efficiency with or without heat fixes the limit of his knowledge and claims.

Suppose the Patent Office, through some very badly strained interpretation of his references to heat construes them to cover sufficient heat to fuse finely divided slag and lime, or slaked lime. Then we must fall back on the claim that Edison uses neither slaked nor unslaked lime and that Edison in using carbonate of lime cuts out the

preliminary calcining and the slaking. There are on record decisions of the court that any invention that cuts out a distinct step in a process is patentable. If Bodmer contemplated a Portland cement, which he certainly did not, it can be proven then his preliminary calcining and hydrating are useless steps which Edison cut out.

Passing further to Bodmer's statement that "a certain quantity of slag or scoria may be melted together with such proportions of siliceous or argillaceous material either with or without calcareous flux, etc., will say the Patent Office may claim this as an anticipation. If so, it is promptly met by the conclusion of the same sentence, which calls for the incorporation of "lime in the manner described". This latter positively precludes any possibility of his having any conception of a true Portland cement in his process.

The next guess in his vague process is to mix lime or other calcareous material with the slag as it passes from the furnace. It is a mechanical impossibility to make a homogeneous mixture of anything with slag as it passes from the furnace, but granting that some wonderful mechanical appliance could be invented it is further impossible because the temperature of the formation of that slag is far below the temperature at which lime would combine with it, and the addition of the lime would still further reduce the temperature of the slag so that the formation of a true Portland

is physically and chemically impossible.

The only thing in his whole patent that merits any consideration is the wild guess in the next to the last paragraph to the effect that "it may be necessary to re-heat and melt the mass" etc. This is at variance with his former claims and is evidently tacked on with no tangible idea in mind and simply to cover all temperatures from atmospheric temperature to fusion. If this patent is held to interfere, then it is equivalent to a dictum that henceforth and forever no process for using slag and calcareous material is patentable, since Bodmer covered it. Fortunately, this idea can be upset by the ruling that the curtailment of a process by cutting out unnecessary steps is patentable and Edison by using limestone cuts out the calcining and hydrating steps.

With these arguments, I think the Bodmer patent can be held as having no bearing on the case.

PATENT OFFICE ACTION OF JULY 15, 1902.

This grants the method of disintegrating the slag is different, but on re-application I think you will find enough data in the foregoing to show that it is radically different throughout.

SENATE PATENT

We see no reason for citing this patent.

Snelus' process consists of the following operations:

- 1st - 2nd - 3rd - 4th - 5th - 6th*
- 1st - Production of a blast furnace slag.
 - 2nd - Production of lime by calcining limestone or similar material.
 - 3rd - Grinding them together.
 - 4th - Hydrating lime and moulding into bricks.
 - 5th - Burning in a furnace.
 - 6th - Regrinding.

Edison eliminates operation 2nd, inasmuch as he uses no lime or hydrated lime in any step of the process. Moreover, in direct contrast he makes a specific slag by the use of limestone and other suitable materials. Snelus makes no mention of any process for making his slag, nor does either he or Bodner appreciate the fact that no blast furnace slag is sufficiently high in lime or otherwise properly balanced to make a true Portland cement. Neither of them disclose the fact that it is not commercially profitable to produce in a blast furnace in one operation any mixture that would make a true Portland cement. Edison appreciates this and shows that the temperature required to fuse a mixture high enough in lime to make a Portland cement is not practical in a blast furnace and he therefore divides his process into two steps:

- 1st - Production in a blast furnace, from limestone, (not lime or hydrate of lime), and other materials a low lime easily fusible slag.
- 2nd - The enrichment of this slag in lime by the addition of ground limestone and subsequent treatment in a rotary kiln of other furnace.

The mechanical steps here are irrelevant as the chemical and metallurgical steps are entirely different

in that Edison uses limestone and Snelus uses hydrate of lime, requiring first the production of lime, and secondly the hydration of that lime if the slag is not sufficiently wet to hydrate it. Edison uses no lime. His slag is never wet for the hydration of lime, nor does he make bricks of any kind. The objections by reference to this patent should be withdrawn, as there is absolutely no similarity to Edison's invention nor is there in the patent anything to anticipate Edison's invention, or suggest it even in the remotest degree.

FORRELL PATENT

This patent is cited merely to offset Edison's method of disintegrating the slag. As I understand it, this is not the basic principle of Edison's invention, but is only a step in the process, hence the patent can be allowed with or without it, preferably with it, as a combination.

Forrell makes no claim to Portland cement.

He makes no addition to the slag of lime, hydrated lime nor limestone. He makes no change in its ultimate chemical composition, except as water from the steam enters into chemical combination. He specifies no composition of slag and does not enrich that slag in lime by any possible means. There is no blast furnace slag produced that would make a true Portland cement by his process. He does not even claim or anticipate it. The use of steam in disintegrating slag

in a Portland cement process is certainly new. Should they refuse to allow this feature it is not fatal to the process since it is a means to an end and not a fundamental principle.

PATENT OFFICE ACTION - SEPT. 8, 1908.

The citation of the Hurry & Seaman patent #7139 can be overcome as follows: The patent office fails to distinguish between an artificial slag or cement making material, as Edison calls it a Portland cement slag or clinker. Hurry and Seaman process contemplates introducing into a blast furnace direct all the materials necessary for Portland cement and after fueling, cool, disintegrate and grind the product. This is a one stage process which never was, is not and can not be commercially practical. They failed to appreciate the fact that materials in the proper proportion to make Portland cement fuse at so high a temperature as to render it altogether impractical to make it a commercial proposition. They do not realize the necessity of first producing an easily fusible slag low in lime in a blast furnace and then enriching in lime by subsequent furnace treatment with the addition of either lime or limestone. They fall down both on their theory and practice and the process is inoperative. Edison appreciated both the theory and practice in that he specifies a two furnace process; first to produce a low lime practical slag, and then to enrich in lime.

The Patent Office reference of Sept. 8, 1906, to Bodmer is offset by the foregoing discussion of Bodmer patent. He did not contemplate a Portland cement, did not appreciate the necessity of heating to partial fusion the second time, and moreover introduced unnecessary and uneconomical steps in calcining and hydrating lime. The addition of limestones instead of lime or hydrated lime is a very important, economical feature of Edison's invention and must not be overlooked by the Patent Office.

PATENT OFFICE ACTION - OCT. 11, 1909.

This rejection apparently drops Bodmer, Forell, Hurry and Seaman and Enslue, and if this implies that you have met their objections on these points and they withdraw them, the foregoing arguments are unnecessary, but if they still hold each objection as made and each subsequent rejection as an amended reason, then all the foregoing arguments are essentially vital in the next amendment.

Referring to the particular action of Oct. 11, 1909, will say they complain of the lack of "specific combination of materials for the production of slag of the quality desired". This objection is not well founded and is evidently due to the lack of metallurgical knowledge in the Patent Office. They fail to appreciate any practical significance in the fusibility of slags as

governed by their chemical composition. Different combinations of Silica, Alumina, Oxide of Iron, Lime and Magnesia require different temperatures for their fusion. Certain temperatures are commercially obtainable in blast furnaces. A process calling for a higher temperature is impractical. It was on this point that Hurry and Seaman fell down. They proposed to fuse in a blast furnace a mixture which when ground would have a Portland cement composition. The slag as tapped from their furnace would, therefore, have to be about as follows:-

Silica -	about	18 to 24%
Lime -	"	60 to 64%
Oxide of Iron & Alumina -	"	9 to 12%
Magnesia, Alkalies, &c.	"	3 to 6%

Hurry and Seaman did not appreciate the fact that a slag varying between the above limits would be so difficultly fusible that it is not commercially practical in a blast furnace. The temperature required in the above case would be from 2500 deg. to 3000 deg. F.

Edison did appreciate that fact and his invention is based on the production first of a more fusible slag and then subsequent treatment of that slag so as to enrich it in lime by the commercially economical process of partially fusing with the addition of carbonate of lime and with a definite end in view, not the uneconomical addition

of lime or hydrate of lime suggested by Bodmer with no defined end in view.

I think the Patent Office overlooked the specific combination given by Edison in the original application, page 4. The application does give a specific combination. It distinctly states at bottom of page one:- "correct proportions of siliceous material, such a quartz with sufficiently low percentage of limestone", etc. Note the word limestone, not lime. Then turn to page 4 and note that he specifically names a combination which should result as follows:-

Silica	32%
Lime	50%
Oxide of Iron & Alumina	12%
Magnesia, Alkalies, &c	8%

If this is not specific, I can not understand what they mean by specific. Pages 1 and 2 state the sources of the different ingredients and the reasons for not combining them directly in a rotary kiln. Page 4 gives a specific percentage for each ingredient, claiming a reasonable variation from those limits which is of course allowable.

The failure in the Patent Office is to discriminate between the limits of Hurry and Sedman slag with lime from 60 to 64% and the Edison slag or cement material with lime about 50%. The distinction is that the composition with 60 to 64% lime and 18 to 24% silica, etc.,

can not be made into a fluid slag economically in a blast furnace while the Edison composition as given on page 4, Silicon 32%, etc., is easily fusible and can be made into a fluid slag economically in a blast furnace. If the Patent Office refer this to their metallurgical experts they will find a wide difference between a slag of 60 to 64% lime and one of 50% lime. So wide is the difference that Hurry and Seaman fell down because it was not possible and Edison succeeds because of his discovery that 50% lime will make an easily fusible slag and that this in combination with subsequent enrichment will make a true Portland cement. It is the combination he claims with such other mechanical features as he deems advisable. If the claims on pages 1 and 2 and the definite composition given on page 4 are not specific enough, then the Patent Office should make a ruling as to what specific combination of materials means.

If it would make it any more specific to state that the silica is obtained from siliceous materials such as quartz, granite, gneiss, trap, basalt, sands, clays, feldspar, etc., or an artificial product containing all or some of the ingredients together with whatever lime they contain, with the addition of limestone or calcareous material, it could be so stated. The iron, alumina, magnesia,

etc., is obtained from the same materials and the total requirements as called for by Edison's invention is that the combination is a specific one, inasmuch as the resulting product in the first stage must approximate the composition given on page 4 of the original application.

If this is not a specific combination, then the ruling as to what constitutes "specific combination" is arbitrary. It specifies distinctly about 50% ^{lime} silica instead of 60 to 64, and about 32% of silica instead of about 18 to 24%. You might incorporate next time the Hurry and Seaman limits to show the contrast.

To meet their objection as to the required temperature being indefinite, will say you might add that a Portland cement slag of 60 to 64% lime will require a temperature 2500 to 3000 deg. F. and that Edison's 50% lime slag in his first stage will require considerably less, - enough less to take it out of the impractical to the practical class. It is not well to give any definite temperature for this 50% composition, but if compelled might say 1800 to 2000 deg. F. or sg. leaving the "so" to mean a little less or more, as the case may be.

Yours very truly,

J. E. Seaman
Chemist.

Nov. 8, 1911.

Dr. H. E. Kiefer,
Edison Portland Cement Company,
Stewartsville, N. J.

Dear Sir:

yours of the 30th ult. with enclosures, addressed to Mr. Henry Lanahan, has been received. Mr. Lanahan is away at present; and the application of Mr. Edison has been turned over to me for amendment. Your notes contained the information we desired and have been very helpful in amending the application.

Thanking you for your interest and assistance in this matter, I am,

Yours very truly,

FB-KGK

Folio No. 263

Serial No. 335116

Applicant.

Thomas A. Edison

Address.

Title

Grinding Rolls Cement

Filed Sept. 18, 1906

Examiner's Room No. 315

Assignee Thomas A. Edison, Inc.

Ass'g't Exec. June 30, 1906 Recorded July 7, 1906 Liber. 7127 Page 50

Patent No. 962,823

Issued June 28-1910

ACTIONS.

- 1 Rejected Nov. 12, 1906 16
- 2 Amended October 28, 1907 17
- 3 Rejected November 22, 1907 18
- 4 Amended November 13, 1908 19
- 5 Rejection December 14, 1908 20
- 6 Amended Dec. 7, 1909 21
- 7 Allowed Dec. 14, 1909 22
- 8 Final fee due June 14, 1910 23
- 9 " paid June 2, 1910 24
- 10 _____ 25
- 11 _____ 26
- 12 _____ 27
- 13 _____ 28
- 14 _____ 29
- 15 _____ 30

FRANK L. DYER,

Counsel,

Orange, New Jersey.

-SPECIFICATION-

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS ALVA EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, County of Essex and State of New Jersey, have invented a certain new and useful improvement in CRUSHING ROLLS, of which the following is a description:-

My invention relates to new and useful improvements in crushing rolls, adapted particularly for crushing Portland Cement. The objects of my invention are to provide a construction of crushing rolls for the purpose in which the rolls would be always kept in perfect alignment so as to operate to the best advantage, regardless of irregularities in the stream of material fed to the same, and to provide means by which the driven roll may be started to rotate at the commencement of the crushing operation: Heretofore, in the construction of crushing rolls for the purpose, difficulty has been experienced in maintaining the rolls in alignment, resulting in the shafts becoming distorted and consequent injury to the journal boxes. ~~Further-
more, when the rolls have been very heavy, as is necessary
for the crushing of Portland cement, it has been difficult
to start the operation of the driven roll, but obviously
derives its rotation from the driving roll through the
intermediate stream of material in the course of crushing.~~
My improved crushing rolls are of a construction in which

~~these~~ objections ^{has} ~~have~~ been effectively overcome. A

In order that the inventions may be better understood, attention is directed to the accompanying drawings, in which -

Figure 1, is a side view of the improved rolls, embodying the invention in its preferred form,

Figure 2, an end view of the same,

Figure 3, a plan view,

Figure 4, a section on the line 4-4 of Figure 1, and

Figure 5, a detail sectional view on the line 5-5 of Figure 1, looking upwardly.

In all of the above views, corresponding parts are represented by the same numerals of reference.

The machine is carried, preferably on a concrete or cement foundation 1, formed with a pit 2, in which may be located a conveyor belt 3, for carrying off the crushed material. Carried by the foundation 1 are two heavy cross pieces 4-4, keyed to the foundation, as shown, and extending across the pit 2, and bolted to the cross pieces 4-4 are heavy truss beams 5-5, constituting the main frame of the machine. Bolted rigidly to the cross beams 5-5 are stationary blocks 6-6, in which are located bearings 7 for the shaft 8 of the positive or driving crushing roll 9, the crushing surface of which is relatively narrow, ^{and is of the shape shown} as shown. The shaft 8 is driven from a driving shaft 10 through a coupling 11 of any suitable construction. The shaft 10 carries the driving pulley 12 and is mounted in two bearings 13 carried on suitable frames 14, as shown. Mounted on the cross beams 5-5 are the heavy movable blocks 15, carrying bearings 16-16, in which is mounted a shaft 17 of the negative or driven crushing roll 18. This roll is driven from the driving roll 9 through the intermediate

stream of material in the process of crushing. Heretofore difficulty has been experienced in maintaining the alignment of the shafts 8 and 17, resulting in injury to the bearings therefor. With the improved construction in crushing rolls, I employ a heavy bracket 19, extending between the ^{lower}movable blocks 15 and bolted to the same, whereby the two movable blocks operate practically as a single piece. The movable blocks 15 are secured to the cross pieces 5 by bolts 20, which work in slots (see Figure 5) so as to permit the blocks to move slightly. Extending between the blocks 6 and 15 ^{on}each side of the machine are two tie rods 21, which work between plates 22 and 23 between which are located the springs 24, which normally hold the crushing rolls in their proper position with a powerful pressure, but permit the rolls to separate under the work. Material is fed to the crushing rolls through ~~the~~ a hopper 25, supported by cross pieces 26, bolted to the blocks 6-6 and 15-15 respectively. Carried on the shafts 8 and 17 are two "nigger heads" 27, around which a rope 28 may be passed, as shown, whereby when the machine is to be started, the negative roll 18 may be rotated from the driving roll. After the negative roll has been started, it will be rotated effectively through the stream of material to be crushed, passing between them.

Having now described my invention what I claim as new and desire to secure by Letters Patent is as follows:-

3. In crushing rolls, the combination with a positive crushing roll, mounted in fixed bearings, of a negative crushing roll cooperating therewith and mounted in movable bearings, two ^{key} sliding blocks supporting the movable bearings and a heavy cross piece connecting said blocks to result practically in a solid integral structure, substantially as set forth.

3. In crushing rolls, the combination with two parallel supporting frames, and a positive crushing roll mounted in stationary bearings carried by said frames, of a sliding block mounted on each frame, a heavy bracket connecting said blocks so as to tie them rigidly together and a negative crushing roll mounted in bearings carried by the movable blocks, substantially as set forth.

4. In crushing rolls the combination with the positive and negative rolls, of the "nigger head" on the shaft of each roll, ~~adapted to receive~~
^{and for the purpose}
substantially as set forth.

A. Furthermore, in the operation of many heavy crushing rolls, such as ones to be necessary for the crushing of cement clinker, the rolls have been either geared together or independently driven. With my nonuniform crushing rolls, I provide a construction in which the negative roll is operated from the driven roll through the stream of material passing between them. I not only provide a simpler and cheaper construction, but

2) when the rolls are ^{formed} ~~formed~~ on their peripheries with relatively shallow corrugations (as is preferred to assist in the more rapid feed of material between them) the wearing of the rolls does not in any way affect the corrugations, which always ^{retain their} ~~retain their~~ original configuration. With rolls of enormous weight such as those which I employ, it would be practically impossible to start the

(1) In crushing rolls, the combination of a pair of rolls rotating in opposite directions, power connection for driving one of said rolls, the ^{or negative} other roll being driven through the material being crushed between them, and independent means for driving the negative roll from the ^{driven} ~~driven~~ roll, such as s. f.

3) Negative roll into operation through the effect of the material between it and the driven roll, and my device provides effective means whereby the negative roll may be put in rotation from the driven roll, and before the ~~the~~ stream of material is introduced between them.

Original folio and contents
destroyed in fire of Dec. 9-1914

Folio No. 261

Serial No. 334 411

Applicant.

Address.

Thomas A. Edison

Llewellyn Park
West Orange, N.J.

Title: Shaft Bearings

Filed Sept. 13-1906

Examiner's Room No. 322

Assignee.

Ass'g't Exec.

Recorded

Liber

Page

Patent No.

Issued

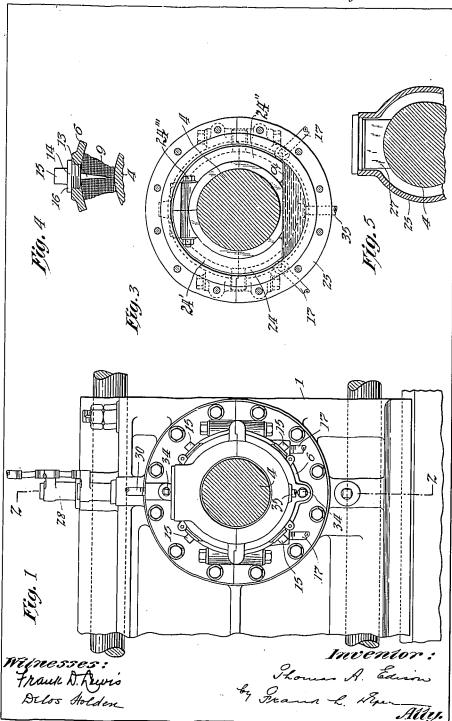
ACTIONS.

1. Office Letter Oct. 27-1906 16 Rejected Feb. 19-1914
2. Amended Aug. 15-1907 17
3. Rejection Oct. 9-1907 18
4. Amended Oct. 6-1908 19
5. Rejection Nov. 21-1908 20
6. Amended Nov. 18-1909 21
7. Rejection Dec. 3-1909 22
8. Amended Nov. 28-1910 23
9. Rejected Dec. 16-1910 24
10. Amended Dec. 13-1911 25
11. Rejected Jan. 17-1912 26
12. Amended Dec. 27-1912 27
13. Rejected Feb. 25-1913 28
14. Amended Jan. 5-1914 29
15. New oath filed Jan. 7-1914 30
- Handwritten notes:*
- "Patent" written vertically next to item 16.
- "Rejection" written vertically next to item 16.
- "Amended" written vertically next to item 16.
- "Jan. 9-1914" written next to item 23.
- "261" written next to item 23.

DYER & HOLDEN,
ORANGE, NEW JERSEY.

22 261

234 411



Witnesses:
Frank R. Davis
Boris Holden

Inventor:
Thomas A. Davis
by James L. Raper
Att'y.

Patented Feb. 27, 1906.
Patented Feb. 27, 1906.
Patented Feb. 27, 1906.
Patented Feb. 27, 1906.
Patented Feb. 27, 1906.

Sol. 261

Serial No. 234,411

357

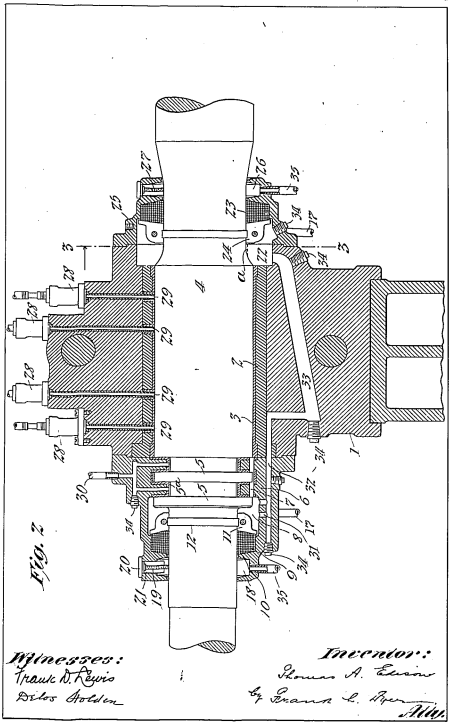


Fig. 2

Witnesses:
Frank A. Lewis
Bates Holden

Inventor:
Thomas A. Lewis
by Grant L. Brown
Att.

[ON BACK OF PRECEDING PAGE]

(Copy of ch. & last ^{to} office action
not much ch. as reg. done)

{ Amount due Feb. 19, 1915
Several claims under final rejection
one or two allowed

DEC 19 1914

Copy of the pending claims in the application
of Thomas A. Edison, Serial No. 334411.

Original claims:

11 2 ~~2~~ In a bearing, the combination of a journal
box and casing, a shaft supported therein, said shaft
being reduced in diameter beyond said journal box, an
oil reservoir ^{res.} ~~surrounding~~ said reduced portion, a packing
ring for closing the end of said reservoir, and a wiper
engaging said shaft beyond the packing ring, substantially
as set forth.

The following claim was inserted by amendment
paper No. 4, Amendment B, October 7, 1908.

11 C. The combination of a bearing, a shaft therein, means
for lubricating the shaft within the bearing, a fixed
abutment surrounding the shaft in close proximity thereto,
a flange or abutment rigid with said shaft, a packing ring
of compressible material between said abutments, and means
for holding said ring against rotation, substantially as
set forth. C⁵

The following insertion was made to this claim
by amendment C, paper No. 5, November 19, 1909.

Renumber claim 8 as 6, and in line 6, after
"rotation" insert ^{C⁵} ~~comprising~~ adjustable means extending
radially through the ring and into the bearing.

-----oOo-----

Paper No. 6, Amendment C, November 19, 1909.

The following pending claims were inserted by
this amendment:

Int⁹¹
C¹ 1. The combination with a bearing, a shaft therein,
and means for lubricating the shaft within the bearing,
of a compressible packing ring surrounding the shaft out-

side the bearing, said packing ring being wedge-shaped in cross section with the base of the wedge contacting the shaft, ^{and located behind the bearing} an abutment on one side of the ring, and a flange ^{and spring member, said abutment to clamp the ring} carried by the shaft on the other side of the ring, ^{able to clamp} the ring into firm contact with the shaft and the abutment, substantially as set forth.

The following insertion was made by amendment

0, line 1, "a shaft and a

journal-bearing for the shaft enclosing the same,

3. The combination with a bearing, a shaft therein, and means for lubricating the shaft within the bearing, of a packing ring surrounding the shaft outside the bearing, said packing ring being wedge-shaped in cross section with the base of the wedge contacting the shaft, ^{and located behind the bearing} an abutment on one side of the ring, and a flange carried by the shaft on the other side of the ring, said abutment and flange being shaped to contact firmly the inclined sides of the ring, substantially as set forth.

The following insertion was made by amendment

0, line 1,

"a shaft and a

journal-bearing for the shaft enclosing the same,

4. The combination with a bearing, a shaft therein, and means for lubricating the shaft within the bearing, of a compressible packing ring surrounding the shaft outside the bearing, said packing ring being wedge-shaped in cross section with the base of the wedge contacting the shaft, an abutment ^{secured to} integral with the bearing on the outer side of the ring, and a flange carried by the shaft on the ^{for clamping} inner side of the ring, adjustable to clamp the ring into

firm contact with the shaft and the abutment, said flange and abutment being shaped to contact firmly the inclined sides of the ring, substantially as set forth.

The following insertion was made to this claim
by amendment G, line 1, "a shaft and a
journal-bearing for the shaft enclosing the same.

-----c00-----

The following claim was inserted by paper No.
10, amendment E, December 14, 1911.

5. The combination of a bearing, a shaft therein,
means for lubricating the shaft within the bearing, a
fixed abutment surrounding the shaft in close proximity
thereto, a flange or abutment removably applied to the
shaft, a packing ring surrounding the shaft between the
said abutments, and means for applying the removable
abutment to the shaft to force the ring into firm contact
with the shaft and the fixed abutment, substantially as
set forth.

The following insertion was made by paper No. 14,
amendment G, line 1, "a shaft and a
journal bearing for the shaft enclosing the same

-----c00-----

The following claim was added by paper No. 12,
amendment F, December 28, 1912.

Sub 82
7. The combination ^{with} of a bearing, a shaft therein, means for lubricating the shaft within the bearing, a fixed abutment surrounding the shaft in close proximity thereto, ^{and beyond the bearing} a flange or abutment removably applied to the shaft between said bearing and said fixed abutment, a packing ring surrounding the shaft between the said abutments, and means for applying the removable abutment to the shaft to force the ring into firm contact with the shaft and the fixed abutment, substantially as set forth.

The following insertion was made in this claim by paper No. 14, Amendment G, January 16, 1914.

82
Claim 7, line 1, insert a shaft and a journal-bearing for the shaft enclosing the same.

-----000-----

The following claims were added by Amendment G, January 6, 1914:

82
8. The combination with a shaft and a journal-bearing for the shaft enclosing the same, of a packing ring surrounding the shaft and located beyond the bearing and out of engagement with the bearing, an abutment engaging one side of the ring, and a flange carried by the shaft and engaging the other side of the ring, substantially as described.

9. The combination with a shaft and a journal-bearing for the shaft enclosing the same, of a packing ring surrounding the shaft, an abutment engaging one side of the ring, and a flange carried by the shaft and firmly engaging the other side of said ring, said flange being

located between said bearing and ring, substantially as described.

10. The combination with a shaft and a journal-bearing for the shaft enclosing the same, of a packing ring surrounding the shaft, an abutment engaging one side of the ring and located beyond the bearing, and a flange carried by the shaft and engaging the other side of the ring, said abutment, ring and flange being so shaped that the engagement of the abutment and flange with the ring will maintain the latter in engagement with the shaft, substantially as described.

11. The combination with a shaft and a journal bearing for the shaft enclosing the same, of a packing ring surrounding the shaft, means connected with one end of the bearing and enclosing the shaft comprising an abutment engaging one side of the ring and located beyond the bearing, and a flange secured to the shaft and engaging the other side of the ring, substantially as described.

Paper No. 13, February 25, 1913.

Div. 12. Room 322.

Frank E. Dyer,

Edison Laboratory,

Orange, N. J.

Thomas A. Edison, Serial 334411, Filed September 13, 1906,
for Shaft Bearings.

This case has been examined as amended Dec. 28, 1912

The attorney having acted as notary in this application, a new oath is required. 123-O. G. 659.

Claims 1; 3, 5 are rejected on the patent to Benjamin 817898, April 17, 1906, 64-22, in view of either of the patents to

British Agar 10575, May 20, 1905-64-22

Wendell 483333, September 27, 1892-64-22-W. C.
which show wedge shaped packings to be old.

Claims 4 and 7 are rejected on the above references, the fixed outer abutment being shown in Agar and Wendall cited.

February 19, 1914.

Paper No. 16.

Div. 12, Room 322.

Frank J. Dyer,

Edison Laboratory,

Orange, N. J.

T. A. Edison, for Shaft Bearings filed September 13,
1906, Serial No. 334411.

Responsive to the communication of January 8,
1914.

Claims 1, 3, 4, 5 and 7, are finally rejected on the references and for the reasons of record. There would be no invention in letting one of the abutting flanges of Wendell or Agar rotate with the shaft, in view of Benjamin. As regards the point that no bearing is shown by Agar, applicant's attention is directed to the fact that rotating shafts are generally supported in bearings.

Claims 8 to 11 inclusive, are substantially like claims heretofore presented, and are finally rejected on the references and for the reasons above given.

Claims 2 and 6 are allowable as at present advised.

ALLOWED CLAIMS.

2. In a bearing, the combination of a journal box and casing, a shaft supported therein, said shaft being reduced in diameter beyond said journal box, an oil reservoir for said reduced portion, a packing ring for closing the end of said reservoir, and a wiper engaging said shaft beyond the packing ring, substantially as set forth.

6. The combination of a bearing, a shaft therein, means for lubricating the shaft within the bearing, a fixed abutment surrounding the shaft in close proximity thereto, a flange or abutment rigid with said shaft, a packing ring of compressible material between said abutments, and means for holding said ring against rotation comprising adjustable means extending radially through the ring and into the bearing, substantially as set forth.

CLAIMS FINALLY REJECTED.

1. The combination with a shaft and a journal-bearing for the shaft enclosing the same, of means for lubricating the shaft within the bearing, of a compressible packing ring surrounding the shaft outside the bearing, said packing ring being wedge-shaped in cross section with the base of the wedge contacting the shaft, an abutment on one side of the ring, and located beyond the bearing, and a flange carried by the shaft on the other side of the ring and coacting with said abutment to clamp the ring into firm contact with the shaft and the abutment, substantially as set forth.

3. The combination with a shaft and a journal-bearing

for the shaft enclosing the same, of means for lubricating the shaft within the bearing, of a packing ring surrounding the shaft outside the bearing, said packing ring being wedge-shaped in cross section with the base of the wedge contacting the shaft, an abutment on one side of the ring and located beyond the bearing, and a flange carried by the shaft on the other side of the ring, said abutment and flange being shaped to contact firmly the inclined sides of the ring, substantially as set forth.

4. The combination with a shaft and a journal-bearing for the shaft enclosing the same, of means for lubricating the shaft within the bearing, of a compressible packing ring surrounding the shaft outside the bearing, said packing ring being wedge-shaped in cross section with the base of the wedge contacting the shaft, an abutment secured to the bearing on the outer side of the ring and a flange carried by the shaft between the bearing and the ring for clamping the ring into firm contact with the shaft and the abutment, said flange and abutment being shaped to contact firmly the inclined sides of the ring, substantially as set forth.

5. The combination with a shaft and a journal-bearing for the shaft enclosing the same, of means for lubricating the shaft within the bearing, a fixed abutment surrounding the shaft in close proximity thereto and beyond the bearing, a flange or abutment removably applied to the shaft, intermediate its ends, a packing ring surrounding the shaft between the said abutments, and means for applying the removable abutment to the shaft to force the ring into firm contact with the shaft and the fixed abutment, substantially as set forth.

7. The combination with a shaft and a journal-bearing for the shaft enclosing the same, of means for lubricating the shaft within the bearing, a fixed abutment surrounding the shaft in close proximity thereto, and beyond the bearing, a flange or abutment removably applied to the shaft between said bearing and said fixed abutment, a packing ring surrounding the shaft between the said abutments, and means for applying the removable abutment to the shaft to force the ring into firm contact with the shaft and the fixed abutment, substantially as set forth.

8. The combination with a shaft and a journal-bearing for the shaft enclosing the same, of a packing ring surrounding the shaft and located beyond the bearing and out of engagement with the bearing, an abutment engaging one side of the ring, and a flange carried by the shaft and engaging the other side of the ring, substantially as described.

9. The combination with a shaft and a journal-bearing for the shaft enclosing the same, of a packing ring surrounding the shaft, an abutment engaging one side of the ring, and a flange carried by the shaft and firmly engaging the other side of said ring, said flange being located between said bearing and ring, substantially as described.

10. The combination with a shaft and a journal-bearing for the shaft enclosing the same, of a packing ring surrounding the shaft, an abutment engaging one side of the ring and located beyond the bearing, and a flange carried by the shaft and engaging the other side of the ring, said abutment, ring and flange being so shaped that the engagement of the abutment and flange with the ring will maintain the latter in engagement with the shaft, substantially as described.

11. The combination with a shaft and a journal-bearing for the shaft enclosing the same, of a packing ring surrounding the shaft, means connected with one end of the bearing and enclosing the shaft comprising an abutment engaging one side of the ring and located beyond the bearing, and a flange secured to the shaft and engaging the other side of the ring, substantially as described.

Folio No.

275

Serial No.

346,043

Applicant.

Thomas O. Edison

Address.

Title

Acoustic Burning Apparatus

Filed

Nov. 26, 1906

Examiner's Room No.

169
308

Assignee

Ass'g't Exec.

Recorded

Liber

Page

Patent No.

Issued

ACTIONS.

- | | | |
|----|--|----|
| 1 | Rejected Dec 7, 1906 | 16 |
| 2 | October 15, 1907. Amended | 17 |
| 3 | Rejected December 11, 1907. | 18 |
| 4 | Amended December 8, 1908. | 19 |
| 5 | Rejected Jan. 9, 1909. | 20 |
| 6 | Amended Jan. 5, 1910. | 21 |
| 7 | Rejected Jan. 21, 1910. | 22 |
| 8 | Appeal to Examiners in Chief Jan. 21, 1911. | 23 |
| 9 | Examiner's statement Jan. 21, 1911. | 24 |
| 10 | Appeal to the Hon. Board of Examiners in Chief | 25 |
| 11 | Decision of Examiners in Chief 7/1/11 | 26 |
| 12 | | 27 |
| 13 | | 28 |
| 14 | | 29 |
| 15 | | 30 |

Case dropped by authority
 of Mr. Dyer -

H.C.

5/24/11

FRANK L. DYER,

Counsel,

Orange, New Jersey.

275

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS ALVA EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, County of Essex and State of New Jersey

prays that letters patent may be granted to him for the improvements in

IMPROVED BURNING APPARATUS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Edison Laboratory, Orange, New Jersey, his
attorney, with full power of substitution and revocation, to prosecute this
application, to make alterations and amendments therein, to receive the patent,
and to transact all business in the Patent Office connected therewith.

Thomas A. Edison

-- SPECIFICATION --

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS ALVA EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, in the County of Essex and State of New Jersey, have invented certain new and useful improvements in CEMENT BURNING APPARATUS, of which the following is a description:

My invention relates to improvements in cement burning apparatus and my object is to produce an apparatus for the purpose in which heat may be more effectively abstracted from the clinkered material than is now done. With modern rotary cement kilns, it is the practice to draw the incoming air over the previously clinkered material either by accumulating the very hot clinker balls in a chamber or pit, through which the incoming air is drawn, or by directing the clinkered material into a rotating cooling cylinder through which the incoming air is caused to pass before entering the kiln. Whichever expedient is used, the amount of heat absorbed from the clinkered material is comparatively small, so that although enormous quantities of air require to be burned, which if efficiently brought into contact with the clinkered material could be made to absorb a very large proportion of the heat thereof, yet under the best modern practice, the clinkered material, while still extremely hot, is allowed to radiate and dissipate most of its heat or is forcibly cooled by a spray of water, prior to the grinding operations, and this heat is entirely lost. What I propose in my pres-

ent apparatus is the use of a cooling chamber connected with the lower end of the kiln and having somewhat the form of a blast furnace. In this cooling chamber, the hot clinker accumulates and is permitted to pass slowly downwards. Part of the air for supporting combustion within the kiln is directed into the cooling chamber under pressure through tuyeres, and is caused to pass upwards through the hot mass in direct contact with the same, so as to effectively abstract heat from the clinkered material, the rest of the air being drawn directly into the kiln by the draft. By thus causing incoming air to be forced into direct contact with the entire body of clinkered material a much greater saving of heat will be effected than with the present practice where the incoming air at best is brought only into superficial contact with the exposed surface of the hot mass.

In order that the invention may be better understood, attention is directed to the accompanying drawing, forming part of this specification, and in which -

Figure 1, is a sectional view, illustrating the lower end of a rotary cement kiln with my improved cooling device shown in connection therewith, and

Figure 2, a section on the line 2-2 of Figure 1. In these views, corresponding parts are represented by the same numerals of reference.

The kiln 1 is of any suitable length, being supported as heretofore on rollers so as to be inclined slightly from the horizontal and being lined with firebrick 2, so as to protect the walls 3, which are formed preferably of cast iron sections. The lower end of the kiln opens into a chamber 4, through which passes one or more nozzles 5, for projecting finely pulverized coal, or other fuel, into the kiln to burn the material therein. Below the chamber 4

is a cooling apparatus 5, comprising a structure roughly resembling a blast furnace and of any suitable height. The cooling apparatus is formed preferably of cement or firebrick and is provided with a channel or passage 6, leading out from its bottom and through which the clinkered material will pass. Adjacent to the passage 6 is a scraper conveyor 7, working in a trough 8, so that as the conveyor is operated the material will be drawn out of the cooling apparatus at a rate depending upon the movement of the conveyor. A part of the air for supplying combustion within the kiln is introduced within the cooling apparatus near its lower end through tuyeres 9 under sufficient pressure to overcome the resistance offered by the mass of clinkered material in the cooling apparatus. I do not consider it desirable to attempt to supply all of the air to the kiln by means of the tuyeres 9, as it would be difficult to force the enormous quantity required through the load of material in the cooling apparatus. Assuming, therefore, that only part of the air is supplied through the tuyeres 9, I provide the chamber 4 with an opening 10 in its rear wall, adapted to be opened to a greater or less extent by a hinged gate 11, so that air may be supplied directly to the kiln by reason of the draft therein. In operation, the clinkered material from the kiln will fall into the cooling apparatus and accumulates therein in a mass of such size as may be desired, being drawn off at the bottom by the operation of the scraper conveyor, as explained. A part of the air for the kiln is introduced within the apparatus through the tuyeres 9, and is blown through the clinkered material, so that the air is forced into contact with all portions of the mass, and will, therefore, very perfectly abstract heat therefrom. In this way a much larger proportion of heat may be conserved than is possi-

ble with existing practice wherein the incoming air is merely brought into superficial contact with the exposed surface of the clinkered mass.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is as follows;

1. In cement burning apparatus, the combination with a rotary cement kiln, of a stationary cooling chamber connected with the lower end thereof, means for permitting the hot clinker from the kiln to pass slowly through the cooling chamber, and means for forcing air under pressure into the cooling chamber, so that the air before reaching the kiln passes through the mass of hot clinker, substantially as and for the purposes set forth.

2. In cement burning apparatus, the combination with a rotary cement kiln, of a stationary cooling chamber connected therewith, and receiving the hot clinker therefrom, means for progressing the hot clinker slowly through the cooling chamber and means for blowing air under pressure in the cooling chamber into direct contact with the hot clinker, substantially as and for the purposes set forth.

3. In cement burning apparatus, the combination with a rotary cement kiln, of a stationary cooling chamber connected with the discharge from the kiln and receiving the hot clinker therefrom, means for causing the hot material to progress slowly through the cooling chamber, and a tuyere located near the bottom of the cooling chamber for permitting air under pressure to be forced through the hot mass before reaching the kiln, substantially as and for the purposes set forth.

4. In a cement burning apparatus, the combination with a rotary cement kiln, of a stationary cooling chamber connected with the discharge therefrom, and formed with an inclined discharge opening, a conveying device located adjacent to the said discharge opening for regulating the flow of material in the cooling chamber, and means for forcing air under pressure within the cooling chamber and in direct contact with the hot material therein, substantially as and for the purposes set forth.

2 4. In cement burning apparatus, the combination with a rotary cement kiln, of a stationary cooling chamber, connected with the lower end thereof, means for permitting the hot clinker from the kiln to pass slowly through the cooling chamber, means for forcing air under pressure into the cooling chamber, ^{at the lower end thereof} so that the air before reaching the kiln passes through the mass of hot clinker, and means for introducing air directly into the kiln, ^{and regulating the flow thereof} substantially as and for the purposes set forth.

Inventor "A" claim 6
October 15, 1907.

This specification signed and witnessed this 16 day of Nov. 1906

Thos. A. Edison

Witnesses:

1. J. L. Ogden
2. A. R. Kleber

Oath.

State of New Jersey }
County of Essex } ss.,

THOMAS ALVA EDISON, the above named
petitioner, being duly sworn, deposes and says that he is a citizen of the United
States, and a resident of Edgewall Park, Orange, County of Essex and
State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the
improvements in

CURRENT BURNING APPARATUS

described and claimed in the annexed specification; that he does not know and
does not believe that the same was ever known or used before his invention or
discovery thereof; or patented or described in any printed publication in the
United States of America or any foreign country before his invention or
discovery thereof, or more than two years prior to this application; or patented
in any country foreign to the United States on an application filed more than
twelve months prior to this application; or in public use or on sale in the
United States for more than two years prior to this application; and that no
application for patent upon said invention has been filed by him or his legal
representatives or assigns in any foreign country.

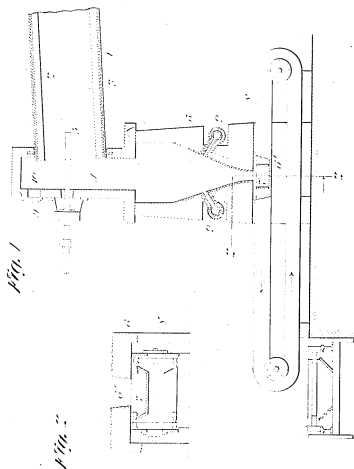
Sworn to and subscribed before me this 16 day of Nov. 1906

J. L. Ogden

[Seal]

Notary Public.

P175



Witness:
 Frank N. Lewis
 Walter A. Brown

Inventor:

Atty.

2-260.

Div. 1-1- Room 503
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

AS

Paper No. 1

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.

Dec. 7, 1906.

Thomas A. Edison,

c/o Frank T. Dyer,

Edison Laboratory,

Orange, N. J.

Please find below a communication from the EXAMINER in charge of your application.

For "Cement Burning Apparatus", filed Nov. 26, 1906, #545,043.

G. I. Allen
Commissioner of Patents.

The claims are rejected on

- ✓ Clayton, 530,961, Nov. 24, 1895 (75, Rev. Cl.),
- ✓ Lewis, 661,700, Nov. 15, 1900 (222, Ret.)
- ✓ Hathway, 328,259, Sep. 1, 1885
- German patent 155,933 (222 Ret.)
- British patent, 27,753 of 1904 (222, Ret.)

IN THE UNITED STATES PATENT OFFICE.

Thomas A. Edison)
CEMENT BURNING APPARATUS)
Filed November 26, 1906) Room No. 308
Serial No. 345,043)

HONORABLE COMMISSIONER OF PATENTS:-

S I R :--

Replying to Office action of
December 7, 1906, please amend the above entitled case as
follows:

Add the following claim 6:

a
6. In a cement burning apparatus, the combination
with a rotary cement kiln, of a stationary cooling chamber
connected with the discharge therefrom, and formed with a
contracted portion at its lower end, terminating in a
discharge opening, and means for forcing air under pressure
within the cooling chamber through the sides thereof and in
the contracted portion of said chamber, substantially as
set forth. -

- R E M A R K S -

The claim submitted herewith, as well as the claims
formerly in the case, is thought to be patentable over the
references.

The English patent No. 27,753 to Gobbe, is for an
apparatus for making producer gas for combustion within the
kiln. The cooling chamber in that patent is designated by
the reference numeral 10, and it is apparent that the claims
cannot be read upon this reference.

The German Patent No.135,933 to Hinz does not meet the claims as in the Hinz patent the incoming air is drawn through the clinker by means of the draft of the kiln, and there is no means for positively forcing the air through the clinker. This is also true of the patent to Mathey No.325,259, while in the patent to Lewis, No.661,700, the incoming air does not appear to be heated by the clinker at all.

The patent No. 330,691, does not have the cooling chamber defined by the claims, but like the English patent has a furnace at or beneath the discharge opening of the kiln.

The patents which have been cited as references therefore, considered either singly or in bulk, as they have been cited by the Examiner, do not meet the claims, and a reconsideration and allowance are therefore requested.

Very respectfully,

THOMAS A. EDISON

By *Frank J. Dyer*

His Attorney.

Orange, New Jersey
October 15 1907.

Div. 15 Room 308
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-260.

AS

Paper No. 3

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

Thomas A. Edison,

WASHINGTON, D. C.,

Dec. 11, 1907.

c/o Frank L. Dyer,

Edison Laboratory,

Orange, N. J.

Please find below a communication from the EXAMINER in charge of your application,
for CEMENT BURNING APPARATUS, filed Nov. 25, 1906, #345,043.

E. B. Moore

Commissioner of Patents.

This case considered as amended Oct. 16, 1907.

The claims are rejected on

Wentz, #714,843, Dec. 2, 1902 (222 - Ret.).

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison

CEMENT BURNING APPARATUS

Filed November 26, 1906

Serial No. 345,043

Room No. 308

HONORABLE COMMISSIONER OF PATENTS:

S I R :

In response to Office action of
December 11, 1907, please amend the above entitled case
as follows:

Cancel Claims 1, 2, 3 and 4.

Insert the following as Claim 1:

- 1. In cement burning apparatus, the combination
with a rotary kiln, of a stationary cooling chamber con-
nected with the discharge therefrom, and formed with an
inclined discharge opening, a scraper conveyor working in
a trough adjacent the said discharge opening for removing
the clinker from the said opening, and regulating the flow
of the clinker in the chamber by its speed of operation,
and means for forcing air under pressure within the cooling
chamber through tuyeres in the ^{side of the inclined part of the} same, so that the air passes
through and is in direct contact with the hot clinker in the
chamber on its way to the kiln, substantially as set forth.

Claim 5, line 6, after "chamber" insert - at the
lower end thereof - . Line 8, after "kiln" insert - and
regulating the flow thereof - .

Claim 6, line 6, cancel "and" after "thereof" .

Renumber Claims 5 and 6 as 2 and 3.

R E M A R K S

The claims are thought to distinguish from the references by specific differences enumerated therein. None of the references disclose the idea of introducing only a part of the air through the hot clinker under pressure, the rest of the air necessary for combustion in the kiln being furnished independently and with regulation. Neither is the specific type of conveyor shown in the references, nor applicant's construction of introducing air through tuyeres at the lower inclined portion of the chamber.

Reconsideration and allowance are requested.

Respectfully submitted.

THOMAS A. EDISON

By

Frank L. Dyer

His Attorney

Orange, New Jersey

December 8, 1908.

275
Div. 15 Room 308

All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-280.

AB

Paper No. 5

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

Thomas A. Edison,

WASHINGTON, D. C.,

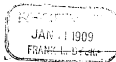
Jan. 9, 1909.

c/o Frank L. Dyer,

Edison Laboratory,

Orange, N. J.

Please find below a communication from the EXAMINER in charge of your application,
for CEMENT BURNING APPARATUS, filed Nov. 26, 1904, #345,043.



E. B. Moore

Commissioner of Patents.

This case considered as amended Dec. 10, 1908.

The claims are rejected on Wents of record. The distinctions do not seem patentably novel.

Chen

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison :
CEMENT BURNING APPARATUS :
Filed November 26, 1906 : Room No. 308.
Serial No. 345,043 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to Office action of
January 9, 1909, please amend this case as follows:

Claim 1, line 9, insert - sides of the inclined
portion of the - before "same".

R E M A R K S

Reconsideration and allowance of the claims as
they now stand are respectfully requested. The dis-
tinctions over the references embodied in the claims are
thought to render the same patentable. In Claim 1, a
scraper conveyor which regulates the flow of clinker in
the chamber by its speed of operation is claimed. This
is not shown in the references. This claim likewise is
limited to means for forcing air under pressure within
the cooling chamber through tuyeres in the sides of the
chamber. In Wentz of record, the air is forced axially
into the chamber. Because of that construction, the
patentee finds it necessary to use baffle plates for

spraying the air out through the clinker. By forcing the air through openings in the side of the inclined portion of the chamber, such a construction as that of Wentz is rendered unnecessary. In Claim 2, means are claimed for forcing air under pressure into the cooling chamber at the lower end thereof, and, in addition, means for introducing air directly into the kiln and regulating the flow thereof. This is not shown in any of the references, and is a valuable feature, since it would be difficult to force the enormous quantity of air required for the kiln through the load of clinker in the cooling apparatus. In Claim 3, as in Claim 1, means are claimed for forcing air under pressure within the cooling chamber through the sides thereof in the contracted portion of the chamber, which is thought to be a patentable distinction.

Respectfully submitted.

THOMAS A. EDISON

By Frank L. Dyer

His Attorney

Orange, New Jersey

January 5th, 1910.

25

Div. 31 Room 169

ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

2-880.

Paper No. 7

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

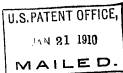
MDP

WASHINGTON, D. C., Jan. 31, 1910.

Thomas A. Edison,

c/o Frank L. Dyer,

Edison Laboratory,



Orange, N. J.
Please find below a communication from the EXAMINER in charge of your application,

No. 345,043, Cement Burning Apparatus, filed November 26, 1906.

E. B. Wilson

Commissioner of Patents.

This case has been reconsidered in view of the amendment
of January 6, 1910.

The claims are again rejected on Wente, of record.

The case is held to contain nothing patentable over said
reference. This action is made final in accordance with the
spirit of the decision in *Ex parte Miller*, 150 O. G., 827, and
the case is in condition for appeal.

Ex parte
Miller

[FROM HENRY LANAHAN]

275

Dec. 22, 1900

Mr. Walter S. Mallory,
Edison Portland Cement Company,
Stewartsville, New Jersey.

Dear Sir:

You will find enclosed herewith, a copy of the specification and print of the drawings of an application which Mr. Edison has filed for a patent for cement burning apparatus. The claims now in the case, three in number, are under final rejection. In the apparatus shown in the drawing, you will note that a part of the air for supplying combustion within the kiln is introduced through the twyers 9 and the hot clinker, and the rest of the air is supplied through the opening 10 which may be opened to a greater or less extent by the hinged gate 11. The references show all the essential features of this apparatus, except the additional means 10 and 11 for supplying air directly to the kiln.

We are trying to decide whether this case is of sufficient importance to warrant the trouble and expense of an appeal. Will you kindly advise us whether the apparatus described in this application has been found to be of

W. S. Mallory

-2-

Dec, 22, 1910.

practical importance, and particularly, whether it has been found important practically to supply a part of the air through the hot clinker, and a part of it through an adjustable opening leading directly from the atmosphere outside the kiln to the interior of the kiln. We must take appropriate action in this case before January 20, 1911, and you are, therefore, requested to give this matter your prompt attention.

Please return the specification and print with your reply, as these are the only copies we have.

Very truly yours,

HL/KOK

(Enclosures)



The Edison Portland Cement Co

THOMAS A. EDISON, CHAIRMAN OF BOARD
W. B. MALLORY, PRESIDENT
J. LEONARD THOMAS, VICE-PRESIDENT
H. P. MILLER, TREASURER
WM. E. HIGGINS, SUCY & ASST. TREAS.

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS, STEWARTSVILLE, N. J.

SALES OFFICES:
PHILADELPHIA, PA., ARCADE BUILDING
NEW YORK, N. Y., GUARDIAN BUILDING
NEWARK, N. J., GUARDIAN BUILDING
BOSTON, MASS., POST OFFICE SQUARE BLDG.
SAVANNAH, GA., NATIONAL BANK BUILDING

December 23, 1910.

Mr. Frank L. Dyer,

Legal Department,

Orange, N. J.

Dear Sir:-

In Mr. Mallory's absence from the office, we beg to acknowledge receipt of yours 22nd, enclosing a copy of specifications and print of the drawing which Mr. Edison has filed, patent on cement burning apparatus.

As soon as Mr. Mallory returns to the office we will place your communication before him, and it will receive his personal and prompt attention.

Yours very truly,

Edw. S. Bigler
Assistant to President.

ESB-RBS

DEC 24 1910

FORM 47A



The Edison Portland Cement Co.

THOMAS A. EDISON, CHAIRMAN OF BOARD
W. B. MALLORY, PRESIDENT
J. LINDEN TUCKERMAN, VICE-PRESIDENT
H. P. MILLER, TREASURER
Wm. E. HUNTER, GEN'L & AGT. TOLSON.

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

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NEWARK, N. J., Union Building
BOSTON, MASS., First Office Square Bldg
SAVANNAH, GA., National Bank Building

P. O. ADDRESS, STEWARTSVILLE, N. J.

January 4, 1911.

Mr. Frank Dyer, Counsel,
Edison Laboratory,
Orange, N. J.

Dear Sir:-

Your favor of the 22nd to Mr. Mallory
has been referred to the writer and in reply will say
that while I am very sorry to see the application fail
I should hesitate to recommend the expense of an appeal.

I am familiar with the Wentz patent
which was issued to Robert P. Wentz of Nazareth 8 or
10 years ago and as far as I know it is the only patent
cited that is at all relevant to the case. It does
cover part of the Edison claims but it has never been
a success. Dexter tried it and several Western mills
tried it.

As to the present status of the hinged
gate being the only new feature will say this is a
doubtful practical utility. There is so much air enters

Smuch

the kiln through openings around the hood and especially between the shell and the annular opening into which it extends that accurate regulation by means of gate at 10 would be rather questionable. If it depends on this for an appeal I should say drop it.

In reply to the latter part of your letter will say the above uncontrollable factor has always made it impossible to demonstrate positively whether it is practically economical to pass part of the air over the hot clinker.

Most mills do it to a greater or less extent but the Vulcanite, the American, the Lawrence and others have no pits for storing clinker but merely a passageway for the clinker to fall by gravity to the elevator boot. There is some little heating of the air here but it is unavoidable and was not designed for that purpose.

There is room for Mr. Edison to invent a discharge end for a kiln which end will not have an annular opening between the shell and the hood and if he

Y.D.

-3-

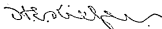
1-4-11.

can prevent air entering there he can pass as much or as little air over the clinker as desirable and regulate the balance by gate #10.

For our kilns the total air would only be about 6,000 to 7,000 cubic feet per minute and this does not seem excessive to me especially in view of the fact that it would all be heated and we should gain in efficiency.

If I understand it rightly amendments are in order and an amendment to cover a device as suggested where I have pencilled X on the drawing in conjunction with the balance of the device would not only be new and novel but would undoubtedly be economical. Every other possible air inlet can be overcome.

Very truly,



HEK-JW

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
CEMENT BURNING APPARATUS,)
Filed November 26, 1906,) Room No. 169.
Serial No. 345,043.)

To the COMMISSIONER OF PATENTS,

S I R:

I hereby appeal to the Examiners-in-Chief from the decision of the Principal Examiner, in the matter of my application for Letters Patent for an improvement in Cement Burning Apparatus, filed November 26, 1906, Serial No. 345,043, which, on the 21st day of January, 1910, was rejected the second time. The following are the points of the decision on which the appeal is taken:

- (1) The Examiner erred in finally rejecting the claims and each of them.
- (2) The Examiner erred in not allowing the claims and each of them.
- (3) The Examiner erred in holding that the claims do not differentiate from the prior art and that they are without patentable novelty.

An oral hearing is requested.

Signed at West Orange, County of Essex and State of New Jersey, this 24th day of January, 1911.

THOMAS A. EDISON

By

Frank L. Rogers
His Attorney.



The Edison Portland Cement Co

THOMAS A. EDISON, CHAIRMAN OF BOARD
W. M. MALLORY, PRESIDENT
J. LINTON THURGOOD, VICE-PRESIDENT
H. P. MILLER, TREASURER
Wm. H. HODGE, SECY & ASST. TREAS.

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS. STEWARTSVILLE, N. J.

SALES OFFICES:

PHILADELPHIA, PA., Arcade Building
NEW YORK, N. Y., St. James Building
NEWARK, N. J., Union Building
BOSTON, MASS., Post Office Square Bldg
SAVANNAH, GA., National Bank Building

January 7, 1911.

Henry Lanahan, Esq.,
Edison Laboratory,
Orange, N. J.

JAN 9-1911

Dear Sir:-

Replying to yours of 5th, will say
I expect to be away the first few days next week, but
could meet you any time after Wednesday.

Inasmuch as I do not think you are
familiar with standard kilns, it strikes me that it
would be much better for you to come here where I can
take you to a kiln and show you clearly any points
about which you are in doubt.

Very truly,

H. S. Giffen
Chemist.

HEK-RBS

Henry Lanahan

F 275

Jan. 18, 1911.

Mr. H. E. Kiefer,
Edison Portland Cement Company,
Stewartsville, New Jersey.

Dear Sir:

I have deferred replying to your letter of January 7th, because I have been waiting for further information from the Patent Office in regard to the application for Cement Burning Apparatus, on which we are going to take an appeal. After I receive this information, I shall endeavor to find time to come over to Stewartsville to talk the matter over with you and to look about the works. I shall communicate with you later either by letter or by telephone to make an appointment.

Yours very truly,

HL/KCK

DEPARTMENT OF THE INTERIOR,

U. S. Patent Office.

In re application of :
 Thomas A. Edison, :
 Cement Burning Apparatus, : Before the
 Filed Nov. 26, 1906, : Examiners-in-Chief
 Serial No. 345,043. : on Appeal.



Examiner's Statement.

Appeal is taken from the action of the Examiner in finally rejecting the following claims:

1. In a cement burning apparatus, the combination with a rotary kiln, of a stationary cooling chamber connected with the discharge therefrom, and formed with an inclined discharge opening, a scraper conveyor working in a trough adjacent the said discharge opening for removing the clinker from the said opening, and regulating the flow of the clinker in the chamber by its speed of operation, and means for forcing air under pressure within the cooling chamber through tuyeres in the sides of the inclined portion of the same, so that the air passes through and is in direct contact with the hot clinker in the chamber on its way to the kiln, substantially as set forth.

2. In cement burning apparatus, the combination with a rotary cement kiln, of a stationary cooling chamber connected with the lower end thereof, means for permitting the hot clinker from the kiln to pass slowly through the cooling chamber, means for forcing air under pressure into the cooling chamber at the lower end thereof, so that the air before reaching the kiln passes through the mass of hot clinker, and means for introducing air directly into the kiln and regulating the flow thereof, substantially as and for the purposes set forth.

3. In a cement burning apparatus, the combination with a rotary cement kiln, of a stationary cooling chamber connected with the discharge therefrom, and formed with a contracted portion at its lower end, terminating in a discharge opening, and means for forcing air under pressure within the cooling chamber through the sides thereof in the contracted portion of said chamber, substantially as set forth.

The reference is:

Wentz, 714,843, December 2, 1902.

The invention relates to a stationary cement cooler with a contracted bottom. Through the sides of the latter air is forced under pressure. Means are also shown for removing the clinker and regulating the flow of the clinker in the cooler by its speed of operation.

Wentz of record discloses a stationary cooler, with means for removing the clinker and regulating the flow of the clinker by its speed of operation. Instead of introducing the air through the sides of the contracted bottom, as in applicant's apparatus, Wentz uses a series of deflectors, 4 5 5 5, centrally supported in the chamber. Air is blown through the clinker as it passes from one deflector to the other by means of a perforated vertical pipe centrally located in said cooler.

It is held that the substitution of tuyeres in the sides of the inclined portion of the cooling chamber, in place of the deflectors and central pipe of Wentz's apparatus, does not involve invention.

Respectfully submitted,

Examiner,

Division 31.

January 21, 1911.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

Sir:

The case of

Thomas A. Edison

Jan. 23, 1911,

Serial } No. *845,043* will be heard by the ~~Commissioner~~
~~Examiners-in-Chief~~
on the *4th* day of *May*, 1911

It is the *third* case on the assignment for that day.

The hearings will commence at ~~ten~~_{one} o'clock, and as soon as
the argument in one case is concluded the succeeding case will
be taken up.

If any party, or his attorney, shall not appear when the
case is called, his right to an oral hearing will be regarded
as waived.

The time allowed for arguments is as follows:

Ex parte cases, thirty minutes;
Motions, thirty minutes, each side;
Interference appeals, final hearing, one hour each side.

By special leave, obtained before the argument is commenced,
the time may be extended.

The appellant shall have the right to open and conclude in
interference cases, and in such case a full and fair opening
must be made.

Briefs in interference appeals must be filed in accordance
with the provisions of Rule 147.

Respectfully,

E. A. Moore
Commissioner of Patents.

To

Thomas A. Edison
of Frank S. Dyer - Atty.
Edison Laboratory

To

Bridge, W. J.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE.

In re application of)

Thomas A. Edison)

CEMENT BURNING APPARATUS)

Filed Nov. 26, 1906)

Serial No. 345,043)

Before the Honorable Board
of Examiners-in-Chief
on Appeal

APPELLANT'S BRIEF

This is an appeal taken from the action of the Examiner in finally rejecting the claims in the above entitled application. The claims rejected are as follows:-

"1. In a cement burning apparatus, the combination with a rotary kiln, of a stationary cooling chamber connected with the discharge therefrom, and formed with an inclined discharge opening, a scraper conveyor working in a trough adjacent the said discharge opening for removing the flow of the clinker from the said opening, and regulating the flow of the clinker in the chamber by its speed of operation, and means for forcing air under pressure within the cooling chamber through tuyeres in the sides of the inclined portion of the same, so that the air passes through and is in direct contact with the hot clinker in the chamber on its way to the kiln, substantially as set forth.

2. In cement burning apparatus, the combination with a rotary cement kiln, of a stationary cooling chamber connected with the lower end thereof, means for permitting the hot clinker from the kiln to pass slowly through the cooling chamber, means for forcing air under pressure into the cooling chamber at the lower end thereof, so that the air before reaching the kiln passes through the mass of hot clinker, and means for introducing air directly into the kiln and regulating the flow thereof, substantially as and for the purposes set forth.

3. In a cement burning apparatus, the combination with a rotary cement kiln, of a stationary cooling chamber connected with the discharge therefrom, and formed with a contracted portion at its

lower end, terminating in a discharge opening, and means for forcing air under pressure within the cooling chamber through the sides thereof in the contracted portion of said chamber, substantially as set forth."

The invention relates to improvements in cement burning apparatus, and more particularly to rotary cement kilns. In this class of apparatus, the material or ore to be calcined is fed into the upper end of a slightly inclined rotary kiln and subjected to intense heat produced by combustion within the kiln. The combustible material, such as finely pulverized coal or other fuel, together with a suitable quantity of air, is introduced into the lower end of the kiln. The ore or material to be calcined moves slowly through the kiln under the combined action of gravity and the rotation of the kiln. The calcined material or clinker is discharged from the lower end of the kiln at a high temperature. The invention covered by the claims in this application relates to means for cooling the hot clinkered material, and at the same time utilizing the heat abstracted therefrom.

In the apparatus invented by applicant, a cooling chamber is provided for receiving the hot clinkered material as it is discharged from the lower end of the rotary kiln. The cooling chamber has a contracted portion in the lower part formed by walls inwardly inclined toward the bottom, and has a discharge opening at the bottom. Means for forcing air under pressure through the hot clinkered mass is provided in the form of pipes or tuyeres, which pass through the inclined sides of the cooling chamber. The shape of the lower portion of the cooling chamber, that is, the portion having the

inclined walls, is such as to cause the clinkered material to be so compacted that the air forced in through the tuyeres will come into intimate contact with all portions of the material, thereby affording ample opportunity for the transfer of heat from the hot material to the cooler air. The advantage of this structure over that shown in the reference will be pointed out hereinafter.

The cooling chamber has an upper portion which fits closely around the lower end of the rotary kiln, and which is provided with an opening or openings for introducing one or more nozzles for projecting the finely pulverized coal or other fuel into the kiln, and also with an additional opening which is covered by an adjustable gate. This additional opening with its adjustable gate furnishes means for introducing air directly into the kiln and regulating the flow thereof, which is considered to be an important feature of this invention. Very large quantities of air are required in apparatus of this class to produce complete combustion, and it is desirable to be able to supply air directly from the outside and independently of the tuyeres, and to regulate the amount of the air so admitted.

Beneath the opening of the cooling chamber there is provided a scraper conveyor working in a trough for conveying away the material as it comes from the cooling chamber, and the rate of discharge of this material may be controlled by controlling the speed of the conveyor. It will be apparent that applicant has invented a simple and efficient mechanism for cooling the clinkered material, for utilizing the heat abstracted therefrom, for

controlling the relative amounts of air supplied through the clinkered material and directly from the outside, and for controlling the rate at which the discharge of the clinkered material takes place.

The claims of the application have been rejected on the patent to Wentz, No. 714,843, granted December 2, 1902. This patent discloses a very complicated apparatus for producing some of the results attained in applicant's apparatus. The patent to Wentz discloses a cooling chamber which is provided with a series of deflectors and a series of hopper-shaped plates. Air is forced into the interior of this cooling chamber through a tube or pipe passing into the interior of the cooling chamber and having openings in its sides. Wentz also provides means for supplying water as an additional cooling means. The air which has been heated by the clinker, together with the steam produced from the water may be fed directly into the lower end of the kiln, or may be mixed with the fuel, and the mixture fed into the kiln. Wentz, however, has provided absolutely no means by which air may be introduced directly into the kiln and its rate of flow regulated. This feature is considered to be of great advantage in applicant's apparatus, and it is included in Claim 2. For this reason Claim 2 is thought to be clearly patentable over the reference.

By providing means for forcing air under pressure into the kiln chamber through tuyeres in the sides of the inclined walls of the same, applicant has been enabled to dispense with the exceedingly complicated arrangement of deflectors and hopper-shaped plates used

by Wentz, and to obtain an equal or superior result with a much simpler structure. As pointed out hereinbefore, the shape of the lower part of the applicant's cooling chamber is such as to compact the material where the air is forced into it, thereby producing a maximum cooling effect upon the clinker and a maximum heating effect upon the air. In the structure shown in Wentz, each current of air passes through only a small portion of the clinkered material, and through a portion of the material where it is very loose, that is, where the material is falling freely from a deflector into the hopper below it. Applicant's simple structure, therefore, possesses decided advantages over the very complex structure shown in the patent. It is believed that these features are clearly brought out in Claims 1 and 3.

Furthermore, in Claim 1 there is recited -

"a scraper conveyor working in a trough adjacent the said discharge opening for removing the clinker from the said opening, and regulating the flow of the clinker in the chamber by its speed of operation".

The structure shown in Wentz includes a vertically adjustable chute or duct, whereby the space between the discharge opening and a rotating table beneath the same may be adjusted. There is provided a stationary scraper held above the table for the purpose of arresting the clinker carried around by the table, and causing it to be fed off into a receiving hopper. In the specification of the Wentz patent it is stated that the rate of discharge is determined by the space between the duct and the table and the speed of revolution of the latter. (See page 5,

lines 69-72 inclusive) It is doubtful whether the speed of the table would have much effect in determining the rate of discharge. The effect of the table in influencing the discharge depends on the frictional engagement between the table and the clinkered material. In applicant's arrangement, a positively acting means for controlling the rate of discharge is provided, which depends only on the speed of the conveyor.

It is also to be noted that in the apparatus shown in Wentz, both the air and fuel are forced into the kiln in jets, whereas, in applicant's apparatus, the air is fed in a diffused body surrounding the fuel jet and adapted to commingle with the fuel in the most efficient manner. This result is due to the provision of a single cooling chamber of large cross section directly connected with the lower end of the rotary kiln, and without obstructions therein to retard the flow of air, instead of employing the complicated system of pipe connections shown in the reference.

It is thought that it has been clearly pointed out in the foregoing remarks that certain essential differences exist between the structure shown and claimed in this application and the structure shown in the patent, and that certain substantial advantages are due to these differences. The Honorable Board of Examiners-in-Chief are therefore respectfully requested to adjudge the claims in issue patentable in their decision on this appeal.

Respectfully submitted,

THOMAS A. EDISON,

By _____

His Attorney

Orange, N. J.

May 2, 1911.

275

2-202

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON



Thomas A. Edison
of Frank B. Jewett, Atty.
Edison Brothers
Orange, N.J.

Sir:

Inclosed find copy of decision this day rendered by the

Examiners-in-Chief in the { ex parte } case of *Thomas*
(interference)
A. Edison — Serial No. 845,042.

By direction of the Commissioner:

Very respectfully,

W. F. Woolard,

Chief Clerk.

Hepp

J.R.S.

Appeal No. 3904.

U. S. PATENT OFFICE.

May 15, 1911.

Before the Examiners-in-Chief, on Appeal.

Application of Thomas A. Edison for a patent for an improvement in Cement Burning Apparatus, filed November 26, 1906, Serial No. 345,043.

Mr. Frank L. Dyer, attorney for appellant.

The applicant has appealed from the action of the primary examiner finally rejecting the following claims:-

1. In cement burning apparatus, the combination with a rotary kiln, of a stationary cooling chamber connected with the discharge therefrom, and formed with an inclined discharge opening, a scraper conveyor working in a trough adjacent the said discharge opening for removing the clinker from the said opening, and regulating the flow of the clinker in the chamber by its speed of operation, and means for forcing air under pressure within the cooling chamber through tuyeres in the sides of the inclined portion of the same, so that the air passes through and is in direct contact with the hot clinker in the chamber on its way to the kiln, substantially as set forth.

2. In cement burning apparatus, the combination with a rotary cement kiln, of a stationary cooling chamber connected with the lower end thereof, means for permitting the hot clinker from the kiln to pass slowly through the cooling chamber, means for forcing air under pressure into the cooling chamber, at the lower end thereof, so that the air before reaching the kiln passes through the mass of hot clinker, and means for introducing air directly into the kiln, and regulating the flow thereof, substantially as and for the purposes set forth.

3. In a cement burning apparatus, the combination with a rotary cement kiln, of a stationary cooling chamber connected with the discharge therefrom, and formed with a contracted portion at its lower end, terminating in a discharge opening, and means for forcing air under pressure within the cooling chamber through the sides thereof in the contracted portion of said chamber, substantially as set forth.

The reference cited is:-

Wentz, 714,843, December 2, 1902.

No error is found in the action of the primary examiner rejecting the appealed claims. The conveyor 52, 53, Fig. 2, of Wentz, is the equivalent of the applicant's conveyor, so far as the combination to which claim 1 is drawn is concerned. The introduction of air into a clinker cooling chamber by means of tuyeres in the sides of the inclined portions thereof, as air is introduced into the ordinary blast furnace, instead of in the manner disclosed by Wentz, Fig. 2, does not involve invention. Claims 1 and 3, therefore, are not allowable.

Wentz supplies air to his kiln from two sources 17 and 38, Fig. 1. It would not involve invention to control and regulate the flow of air through these two air supplies of Wentz. Claim 2 is not allowable in view of this conclusion.

The action of the primary examiner finally rejecting the appealed claims is affirmed.

Fairfax Bayard,
T. G. Steward,
Frank C. Skinner,
Examiners-in-Chief.

May 26, 1911.

Mr. Dyer:-

I hand you herewith application Folio No. 275 filed by Mr. Edison for Cement Burning Apparatus. The three claims in the case were finally rejected on the patent to Wentz, No. 714,843. An appeal was taken to the Board of Examiners-in-Chief, and the case submitted on brief. On May 15, 1911, the Board affirmed the action of the Primary Examiner.

The apparatus described in the application has not been used in practice, and the claims set forth a structure only slightly different from that shown in the reference. I think these differences are fully set forth in the brief filed on appeal. Mr. Holden and I recommend that the case be dropped, and it is now submitted to you for your decision.

Henry Lawson

HL-JS

*Lawson
Drop
Agree*

Folio No. 276Serial No. 345044

Applicant.

Thomas A. Edison

Address.

Title

Blot Furnaces

Filed

Nov. 26, 1906

Examiner's Room No.

172

Assignee

Ass'g't Exec.

Recorded

Liber

Page

Patent No.

Issued

ACTIONS.

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|----|------------------------------------|----|-------------------------|
| 1 | <u>Rejected Dec. 17, 1906</u> | 16 | |
| 2 | <u>Amended October 3, 1907</u> | 17 | |
| 3 | <u>Amended October 28, 1907</u> | 18 | |
| 4 | <u>Rejection January 7, 1908</u> | 19 | |
| 5 | <u>Rejection June 23, 1908</u> | 20 | |
| 6 | <u>Amended June 15, 1909</u> | 21 | |
| 7 | <u>Office Letter June 22, 1909</u> | 22 | <u>Drop. Reissue 71</u> |
| 8 | <u>Amended June 24, 1909</u> | 23 | |
| 9 | <u>Office Letter June 30, 1909</u> | 24 | |
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FRANK L. DYER,

Counsel,

Orange, New Jersey.

276

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS ALVA EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, County of Essex and State of New Jersey

prays that letters patent may be granted to him for the improvements in

BLAST FURNACES

Gas Purifier

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Edison Laboratory, Orange, New Jersey, his
attorney, with full power of substitution and revocation, to prosecute this
application, to make alterations and amendments therein, to receive the patent,
and to transact all business in the Patent Office connected therewith.

Thomas A. Edison

-SPECIFICATION-

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS ALVA EDISON,
a citizen of the United States, residing at Llewellyn
Park, Orange, County of Essex and State of New Jersey,
have invented certain new and useful improvements in
BLAST FURNACES, of which the following is a description:

In modern blast furnace practice, the combustion products are drawn off and part thereof is burned in hot stoves in which is heated the air that is directed to the tuyeres, while the remainder of the combustion gases is consumed industrially in the plant. The attempt is generally made to separate from the combustion gases any fine dust carried therewith, but the devices which have been used for this purpose are ineffective, and consequently the combustion gases carry with them undesirably large proportions of solid material, which injuriously affect the fire-brick, boiler tubes, or gas engine cylinders, in connection with which the gases are burned or used. The object of my invention is to provide an improved filter which I use in connection with a blast furnace, and by which all solid matter will be very perfectly separated from the combustion gases, so that the latter may be used industrially without interfering with the devices in which the gas is burned, or otherwise used. In an application for Letters Patent, filed October 24th, 1906, Serial No. 340,299, I describe an improved cement

burning apparatus in connection with which I make use of a filter of novel construction. My improved filter is of such a character that it will not be affected by very hot gaseous currents passing thru the same, yet, it will at all times perform a very perfect filtering operation without becoming clogged or having its porosity and resistance altered as the material is separated thereby. The improved filter comprises one or more filtering walls, formed of coarse granular material presenting innumerable minute pores and tortuous channels thru which the gaseous currents are caused to seep slowly and in which the solid material carried thereby will be separated. The granular material is kept in movement, so that it is being constantly replenished at its upper part as material is drawn off at the bottom, and the material so drawn off is subjected to a screening operation by which the very fine dust-like particles deposited within the filter may be separated from the granular material which is then returned to the top of the filtering wall. ~~What I propose herein, is the production of an essentially novel blast furnace, by combining therewith a filter of my improved type.~~ Such a filter is of special utility in combination with a blast furnace, for the reason that it is unaffected by the very hot gases, its porosity remains constant so that its presence does not interfere with the correct operation of the blast furnace, and it effects a very perfect separation of the fine dust from the gases, so that the latter can be most effectively used for such industrial purposes as may be desired.

In order that the invention may be better understood, attention is directed to the accompanying drawing, forming part of this specification, and in which I show

a blast furnace of ordinary construction, combined with a filter of my improved type.

The blast furnace 1, is of any suitable form, having the usual tuyeres 2 near its bottom, and a gas pipe 3, leading out of the same near the top, for carrying off the producer gas generated within the same. The gas pipe 3 leads to the upper part of my improved filter, which comprises an enclosed wall having two vertical lines of inclined shelves 4-5 therein, and to which is supplied the desired coarsely ground material, the particles of which range preferably between $1/16$ and $1/8$ of an inch. This material may be coarse gravel, or coarsely ground cement rock. The material accumulates on the inclined shelves 5, in a body of about $1\frac{1}{2}$ inches in thickness and is slowly moved downwardly over the shelves by means of roller feeds 6. Each series of shelves 5 with the material thereon constitute a filtering wall or partition, and the material is supplied to the upper end of each filtering wall in any suitable way. The material is drawn off at the bottom of each filtering wall is removed by a conveyor 7, and is preferably passed to a screening device (not shown) by which the fine dust deposited within the granular material may be separated therefrom. The space between the two filtering partitions constitutes a settling chamber, having an inclined bottom in which is located a conveyor 8, of any suitable type, and in this settling chamber a part of the fine material will deposit by gravity, as will be obvious. The gaseous currents having passed thru the minute and tortuous channels presented by the granular material will be forced off thru

pipes 2, the circulation being effected by the pressure within the blast furnace, and thence the gas passes to the place of use. By passing the gases from the blast furnace thru a filter of the type described, a very perfect separation of the fine material therefrom will be effected, so that the gases will be absolutely pure, and hence can be used to the best advantage for industrial purposes, without the possibility of slagging the bricks of the fire boxes in which they may be used, or of affecting the boiler tubes, or the cylinders of gas engines.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is as follows:-

1. The combination with a blast furnace and gas pipe therefrom, of a filter connected with the gas pipe and presenting a filtering wall or partition of granular material, substantially as and for the purposes set forth.

2. The combination with a blast furnace and gas pipe therefrom, of a filter connected with the gas pipe and presenting a filtering wall or partition of granular material, and means for effecting movement of the granular material, substantially as and for the purposes set forth.

3. The combination with a blast furnace, and gas pipe therefrom, of a filtering apparatus connected with the gas pipe, and comprising an intermediate settling chamber, and opposed filtering walls, formed of granular material, substantially as and for the purposes set forth.

4. The combination with a blast furnace and gas pipe therefrom, of a filtering apparatus connected with

the gas pipe and comprising an intermediate settling chamber, opposed filtering walls formed of granular material, and means for maintaining the granular material in movement, substantially as and for the purposes set forth.

5. The combination with a blast furnace and gas pipe therefrom, of a filter connected with the gas pipe and presenting filtering walls or partitions of granular material, and a settling chamber between the filtering walls, substantially as and for the purposes set forth.

*Inventor A. claims 1 to 7 inclusive
October 3. 1907.*

*Inventor B. claims 8 to 11 inclusive
October 28. 1907*

This specification signed and witnessed this 16 day of Nov 190 6

Thos. A. Edison

Witnesses:

1. J. L. Ogden

2. D. R. Kellum

Oath.

State of New Jersey }
County of Essex } ss.,

THOMAS ALVA EDISON, the above named
petitioner, being duly sworn, deposes and says that he is a citizen of the United
States, and a resident of Mewallan Park, Orange, County of Essex
and State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the
improvements in

BLAST FURNACES

described and claimed in the annexed specification; that he does not know and
does not believe that the same was ever known or used before his invention or
discovery thereof; or patented or described in any printed publication in the
United States of America or any foreign country before his invention or
discovery thereof, or more than two years prior to this application; or patented
in any country foreign to the United States on an application filed more than
twelve months prior to this application; or in public use or on sale in the
United States for more than two years prior to this application; and that no
application for patent upon said invention has been filed by him or his legal
representatives or assigns in any foreign country.

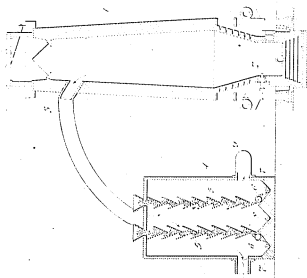
Thos. A. Edison

Sworn to and subscribed before me this 16 day of Nov. 190 6

J. L. Ogden

[Seal]

Notary Public.



Witnesses:
Frank B. Lewis
John A. Wilson

Previous:

Muz.

2-260.

123

Paper No. 1.

Div. 2 Room 176
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

December 17, 1906.

THOMAS A. Edison,

c/o Frank L. Dyer,

Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

Ser. No. 348,044, filed November 26, 1906:--

"First Furnaces".

H. J. Allen
Commissioner of Patents.

It is thought the title of this invention should be "First
Furnace Gas Purifier".

Claim 1 is rejected on:

746,255, Dec. 6, 1903, Baggaley, Fume Arresters, 317.4,
746,256, " " " " " " " " " " " "

in view of:

✓ 565,709, July 7, 1896, Case, Mills, Dust Collectors, U.S. 517.4.

To construct the following devices of Baggaley in each wall of
Case does not involve invention.

Claim 2 is rejected on the references cited. Baggaley shows
elevators to raise granular material to the top of the hopper.

Claims 3 and 4 are rejected on each of Baggaley and on Figure
9 of Case, see page 2, lines 85 et seq.

Claim 5 is substantially the same as claim 3, and the rejected
on the same references.

IN THE UNITED STATES PATENT OFFICE.

Thomas A. Edison)	
DIAST FURNACE)	
Filed November 26, 1906	)	Room No. 176
Serial No. 345,044)	

HONORABLE COMMISSIONER OF PATENTS:

S I R :--

Replying to Office action of December 17, 1906, please amend the above entitled case as follows:

Cancel all the claims now in this case, and substitute the following:

1. The combination with a source of hot gases, of a filter for the gases comprising facing inclined shelves, means for feeding granular material between said shelves and means for removing it therefrom, substantially as set forth.
2. The combination with a source of hot gases, of a filter for the gases comprising facing inclined shelves of opposite inclinations and set closely together, and means for feeding granular material between the shelves, substantially as set forth.
3. The combination with a source of hot gases, of a filter for the gases comprising oppositely inclined facing shelves, the shelves of one inclination being placed opposite the openings in the shelves of the other inclination, and means for feeding granular material between said shelves, substantially as set forth.

4. The combination with a source of hot gases ,
of a filter for the gases comprising oppositely inclined
facing shelves, the shelves of one inclination being placed
opposite the openings in the shelves of the other inclina-
tion, and means for feeding granular material between the
said shelves, ^{and means for removing it therefrom}
substantially as set forth.

5. The combination with a source of hot gases,
of filter walls, means for leading the gases there be-
tween, the said filter walls comprising inclined shelves,
and means for feeding granular material between said shelves,
substantially as set forth.

6. The combination with a source of hot gases,
of filtering walls, means for leading the gases between the
walls, the said filtering walls comprising oppositely in-
clined facing shelves, the shelves of one inclination fac-
ing the openings between the shelves of the opposite inclina-
tion, and means for feeding granular material between the
shelves, substantially as set forth.

7. The combination with a source of hot gases,
of a filter chamber, comprising walls of granular material,
means for admitting the gases between said walls, a settling
chamber between the said walls and means for removing
settlings from the said chamber, substantially as set forth.

- R E M A R K S -

The claims in this case have been rewritten to more
accurately define the invention and their allowance is re-
spectfully requested.

THOMAS A. EDISON

Orange, New Jersey

By Frank L. Dyer

October 3 1907

His Attorney.

IN THE UNITED STATES PATENT OFFICE.

Thomas A. Edison)
)
BLAST FURNACES)
Filed November 26, 1906)
Serial No. 345,044)

Room No. 175

HONORABLE COMMISSIONER OF PATENTS:

S I R :--

This amendment is in addition
to that submitted on October 3, 1907

The claims hereafter added are taken from the
parent application No. 340,299, filed October 24, 1906, in
which last named application division has been required.

Please add the following claims:

8. An improved filter for removing solid or dust-
like particles from gaseous currents, said filter compris-
ing a substantially vertical wall or partition formed of
loosely arranged granular material, means for slowly with-
drawing the granular material from the lower end of the
filtering wall or partition, a screening device to which
the material so withdrawn is delivered and by which the
fine dust-like particles will be separated, and means for
returning the coarse material to the upper end of the
filtering wall, substantially as and for the purposes set
forth.

9. An improved filter for removing solid or dust-
like particles from gaseous currents, said filter com-
prising a plurality of oppositely inclined shelves, and
a mass of granular material supported by said shelves and
forming a filtering wall or partition, presenting innumer-

able tortuous channels through which the gaseous currents may pass and in which the solid or dust-like bodies will be separated, substantially as and for the purposes set forth. AUG 7

10. An improved filter for removing solid or dust-like particles from gaseous currents, said filter comprising a plurality of oppositely inclined shelves, a mass of granular material supported by said shelves and forming a filtering wall or partition presenting innumerable tortuous channels through which the gaseous currents may pass and in which the solid or dust-like bodies will be separated, and means for keeping the mass of granular material in movement, substantially as and for the purposes set forth.

11. An improved filter for removing solid or dust-like particles from gaseous currents, said filter comprising a plurality of oppositely inclined shelves, a mass of granular material ^{separated} separated by said shelves and forming a filtering wall or partition presenting innumerable tortuous channels through which the gaseous currents may pass and in which the solid or dust-like bodies will be separated, means for withdrawing the material at the bottom of the wall or partition, and means for introducing granular material to the top of the filtering wall or partition, substantially as and for the purposes set forth. -

Respectfully,

THOMAS A. EDISON

By Frank L. Dyer
His Attorney.

Orange, New Jersey
October 28th 1907

Div. 5 Room 175
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-260.

1908

Paper No. 4
All communications regarding this
application should give the serial number,
date of filing, and title of invention.

R.A.J. *2716*

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C., January 7, 1908.

Thomas A. Edison,

C/o Frank L. Dyer,

Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

345,044, filed Nov. 26, 1906:----

Blast Furnaces.

E. B. Moore

Commissioner of Patents.

Replying to amendments filed October 4, and October 29,
1906.

Attention is directed to the first paragraph of the
last Office letter. Further the reference to "an essentially
novel blast furnace" in line 20, page 2, is objectionable since
the invention lies in the filter.

Claims 1 and 2 do not patentably distinguish from--
Baggaley, 746,255, of record, said Baggaley illustrating a filter
similar in type to that of applicant, comprising facing shelves,
the apertures shown at 6 in Fig. 1 and in Fig. 14 substantially
forming shelves.

Claim 3 is objectionable as being unwarranted; no means
for returning the coarse material to the upper end of the
filtering wall, having been disclosed in either specification
or drawing in this application.

Further claim 8 does not patentably distinguish from
Case, of record.

Claim 11 is similarly objectionable on account of the
inclusion of the aforesaid "means".

The term "separated" in line 4 of claim 11 is objectionable since the shelves tend rather to hold the mass of granulated material together, rather than to separate it.

The screen referred to in lines 21 and 22, page 3, and in the added claim 8 should be diagrammatically illustrated on the drawing, no more detail being shown than is warranted by the brief reference to said screen in the specification.

Claims 1, 2, 8 and ^{9 10}11 are accordingly rejected. each

Claims 3, 4, 5, 6, 7, 9 and 10 may be allowed.

Examiner, Division 3.

276
Div. 3, Room 175
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-200.

Paper No. 5...

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

June 23, 1908.

R.A.J.,

1 Thomas A. Edison,

C/o Frank L. Dyer,

Orange, N.J.



Please find below a communication from the EXAMINER in charge of your application.

345,044, filed Nov. 26, 1906:----

Blast Furnaces.

E. B. Mors
Commissioner of Patents.

In addition to the references cited in the last Office
letter the following newly discovered references are cited
against the claims in this application.
Austrian patent to Jarchofsky 54,888, June 1, 1901, Fume Arresters, Dry,
Klönne, 231,177, Aug. 17, 1880, F.A., 517.4,
Shields, 793,745, Jul. 4, 1905, same class.

In addition to the references cited against claim 1
in the preceding action, said claim is considered to be met by
each of the three references cited above.

Claim 2 is further rejected on Shields, and also on
Klönne, cited.

Claim 9 is considered to be met by and is rejected on
Jarchofsky.

Claim 10 is rejected on Jarchofsky, taken with Shields.

Claim 11 is rejected on Jarchofsky.

The remaining claims which were ^{ing}not rejected in the preceding
action are still considered allowable.

Examiner, Division 3.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)	
BLAST FURNACES)	
Filed November 26, 1906	)	Room No. 175
Serial No. 345,044)	

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to Office action of June 23, 1908, please amend the above entitled case as follows:

Page 2 of the specification, lines 19, 20 and 21, cancel the sentence beginning "What I propose".

Cancel Claims 1 and 2.

Claim 4, line 6, after "shelves" insert - and means for removing it therefrom - .

Renumber Claims 3 to 7 as 1 to 5 inclusive.

Cancel Claims 8, 9, 10 and 11.

R E M A R K S

Office actions of January 7th, 1908 and June 23, 1908 are answered by this amendment, and the case is apparently placed in condition for allowance, which is requested. At the same time, the Examiner's attention is called to applicant's application Serial No. 486,204, GAS PURIFIERS, filed March 27, 1909. If this latter application is speedily allowed, it is thought that appli-

cant will not need to further prosecute the present case,
certain of the claims in the present case having been
transferred to application Serial No. 486,204 referred to.

Respectfully submitted.

THOMAS A. EDISON

By

Frank L. Dyer.

His Attorney

Orange, New Jersey

June 15th, 1909.

2-260.

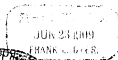
276
Div. Room. 175
All communications should be addressed to:
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Washington, D. C."

Paper No.
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

R.A.J.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

June 22, 1909



Thomas A. Edison,
C/o Frank L. Dyer,

Orange, N.J.

Please find below a communication from the EXAMINER in charge of your application,

345,044, filed Nov. 26, 1906:---

Blast Furnaces.

E. B. Moore

Commissioner of Patents.

Replying to amendment filed June 16, 1909.

The title of invention should, it is thought, be changed to

Blast Furnace Gas Purifier in line 7, page 1 of the specification.

The application appears to be otherwise in condition for
allowance.

Examiner, Division 3.

*Amended
Should*

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)	
BLAST FURNACES)	
Filed November 26, 1906	)	Room No. 175
Serial No. 345,044)	

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to Office Letter of June
22nd, 1909, please amend as follows:

Page 1 of the Specification, line 7, change the
title of the invention to. - Blast Furnace Gas Purifier - .
Respectfully submitted.

THOMAS A. EDISON

By Frank L. Dyer
His Attorney

Orange, New Jersey

June 24th, 1909.

276

Div. 3 Room 175
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-280.

Paper No. 9
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

R.A.J.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

June 30, 1909.

Thomas A. Edison,

C/o Frank L. Dyer,

Orange, N.J.



Please find below a communication from the EXAMINER in charge of your application,

345,044, filed Nov. 26, 1909'****

Blast Furnaces.

E. B. Moore

Commissioner of Patents.

Replying to amendment filed June 25, 1909.

Applicant's pending case serial number 486,204, having been allowed, the claims in this case are rejected for the reason that, and as stated by applicant, the patentable claims therein have been incorporated in application # 486,204, it being noted that applicant in the record of the last named case has stated that when such application is allowed the present case (345,044) will be abandoned.

Examiner, Division 3.



Amended

Folio No.

280

Serial No.

352 417

Applicant.

Thos. A. Edison

Address.

Orange

Title

Process of Concentrating Silica Ores

Filed

Jan. 15 1907

Examiner's Room No.

315

Assignee

Ass'g't Exec.

Recorded

Liber

Page

Patent No.

Issued

ACTIONS.

1. Office letter requiring drawing Jan. 2, 1907 16
2. Drawing sent Jan. 12, 1907 17
3. Rejected March 5, 1907 18
4. Reconsideration requested Nov. 25, 1907 19
5. Rejected December 12, 1907 20
6. Drawing withdrawn December 8, 1908 21
7. Rejected December 16, 1908 22
8. Withdrawn Dec. 14, 1909 23
9. Rejected Jan. 11, 1910 24
10. Withdrawn Dec. 19, 1910 25
11. Finally rejected Jan. 3, 1911 26
12. New matter Jan. 17, 1911 27
13. Acknowledged Jan. 21, 1911 28
14. 29
15. 30

Dropped Dec. 22, 1911

by instructions of
Mr. Edison

HC

Fault

FRANK L. DYER,

Counsel,

Orange, New Jersey.

Received
Dec. 11, 1906
Ex. 1000 & 1000

The object of invention is to remove metallic silver from Arsenical Cobalt ore.

The invention consists in first crushing the ore by crushers to a predetermined size & ~~then~~ screen the same & collect the last 2% of the ore which does not pass the screen. The whole of the remaining 98% is then crushed by smooth rolls feeding in a thin stream the opening of the rolls being about 1/4 less than the screen hole through which the ore was previously passed. The ore is then passed over a still finer screen ~~which is~~ ~~also~~ slightly larger than the roll

opening and the ore is screened ~~again~~ & recrushed until 98% of the ore passes the screen the remaining 2% is saved as concentrate. The rolls are then set closer & the same operation is performed each screening about 2% being the last portion on the screen is removed & not permitted to pass.

The ore is gradually reduced by several operations to fine powder, the various remainders not passing the screens will be found in most of the Arsenical Silver ore especially those from Canada to contain

from 90 to 95 percent of the silver originally contained in the matter. This concentrate can then be still further concentrated on smaller rolls and another set of screens until the concentrate is nearly all silver. The principle of this process is that the arsenical silver ores contain as a rule very little silver as sulphide or other combination but is in the metallic form & the action of the rolls is to reduce the ore finer & increase the size of the silver by rolling it but so that it will not pass the screens

great care should be taken in the successive crushing & screening that the rolls should be fed in a very thin stream one particle thick otherwise the ore tends to break up the flattened plates of silver also that the screens should be smooth sheets perforated with coarse screens -

Claim process of Rosenbury the silver from ores containing it in metallic state by crushing & screening several times each time reducing the size of the ore while increasing the size of the silver

relative to the screen holes

fills well for them etc

Petition.

To the Commissioner of Patents :

Your Petitioner **THOMAS ALVA EDISON**,
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, County of Essex, and State of New Jer-
sey,

prays that letters patent may be granted to him for the improvements in

PROCESS OF CONCENTRATING SILVER ORES,

set forth in the annexed specification ; and he hereby appoints **Frank L. Dyer**
(Registration No. 560), of Edison Laboratory, Orange, New Jersey, his
attorney, with full power of substitution and revocation, to prosecute this
application, to make alterations and amendments therein, to receive the patent,
and to transact all business in the Patent Office connected therewith.

Thos A. Edison.

- SPECIFICATION -

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS ALVA EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, County of Essex and State of New Jersey, have invented a certain new and useful PROCESS OF ^{and apparatus for} CONCENTRATING SILVER ORES, of which the following is a description:-

My invention relates to an improved process of concentrating silver ores, and it is based on the discovery that many arsenical cobalt ores contain silver, which for almost its entire bulk, is in a metallic state. Contrary to the statements of mineralogists, very little of the silver in these ores exists in the form of sulfid or other combination, but I have found, as stated, that it is almost wholly metallic and exists as small granules and irregularly shaped grains. This is especially true of the Canadian cobalt silver ores.

My invention presents a purely mechanical process by which ores containing metallic silver can be concentrated at low cost, and practically all of the precious metal recovered. At the same time, the process is expeditious, involves very simple apparatus, can be carried on without high technical skill and permits very large quantities of ore to be handled. The principle underlying the invention, is that by carefully crushing the ores between crushing rolls, the non-metallic material will be reduced in size, while the metallic granules or grains will be flattened so

as to increase their area, thereby permitting an effective separation of the metallic from the non-metallic portions of the ore by an ordinary screening operation. Preferably, the process involves a series of crushing operations, of gradually reduced fineness, whereby the non-metallic material will be gradually reduced in size, until it reaches a condition of fine powder. After each of the crushing operations, such of the metallic particles, as may be large enough to be engaged by the crushing rolls so as to have their area thereby increased, are preferably separated by the screens. These operations are repeated, the non-metallic material being gradually reduced, and the metallic granules being compressed or flattened so as to permit their separation until the bulk of the metallic particles has been recovered in the concentrates. I consider it preferable to effect a screening operation after each crushing action, so as to recover the sufficiently enlarged metallic granules, rather than to first reduce the non-metallic material to the ultimate fineness desired, and to then attempt to recover the metallic particles by a screening action, because in the latter case, loss would be experienced by the breaking up of the metallic flakes in passing them successively between the rolls. The best results are also obtained when the screens are proportioned to the size of the ground, non-metallic particles, so that while permitting the bulk of the latter to pass through as ^{tailings} ~~tailings~~, such of the metallic granules as may have been flattened or enlarged by the preceding crushing operation will be retained in the concentrates. At the same time this selection of the screening openings is not

absolutely essential, since a single screen may be employed for handling the product of two, or even more, of the crushing operations. In carrying my invention into effect in its preferred embodiment, and with a suitable arsenical cobalt ore, for example, I proceed as follows:

The ore is first passed between crushing rolls and reduced to a predetermined maximum size. The effect of the crushing is two-fold, first, the larger or non-metallic part of the ore being brittle and friable, will be reduced so that its larger particles will represent the predetermined size desired, ranging from that size to excessively fine particles, and second, the larger metallic particles or granules being ductile, will be flattened somewhat and increased in area. The smaller metallic particles, i.e. those less in diameter than the distance between the rolls, will pass through without being affected. The crushed material is now carefully screened over one or more screens which consist of a thin steel plate, formed with elongated screening slots therein, about the same width as the distance between the crushing rolls. By reason of this screening operation, a large portion - say 98% of the material will pass through the screens, the remaining tailings or concentrates being largely composed of the flattened or enlarged metallic granules, whose shape has been changed by the crushing rolls. I now set the crushing rolls closer together, so that the gap will be about 25% less than at the first pass, and I pass the screened material through the crushing rolls. In this re-crushing operation, it is important that the material should be fed to the rolls in a wide, but exceedingly thin stream, only about one particle thick, in order that

the flattened metallic granules may not become broken up between the ore particles during the reduction of the latter. This careful feeding of the material during the recrushing operation can be readily performed by means of an adjustable roller feed, as is common in the art. The recrushed material is again screened by slotted screens as before, the size of the screening slots being preferably about equal to the distance between the crushing rolls. In this recrushing operation, the bulk - say about 98% - of the material will pass through the screens, while the concentrates, amounting, say, to about 2% of the recrushed material, will be very rich in silver, since the effect of the recrushing operation will be to increase the area of the metallic particles, many of which are thus enlarged sufficiently to be caught by the second screens.

The operations described are repeated as many times as may be desired, the material being successively passed between crushing rolls in a very thin stream, and the width of the gap between the crushing rolls being gradually lessened, and after each crushing operation the material being preferably passed over slotted screens, proportioned as explained, to the gap between the rolls of the immediately preceding crushing operation, whereby there will be removed from the crushed material after each crushing operation, the metallic granules whose area has been sufficiently increased to be caught by the corresponding screens. In this way, a very small percentage of the material, rich in silver, will be retained as the tailings of each of the screens. When the ore has in this way been reduced to a fine powder, the bulk of the metallic silver originally contained in the ore, will be re-

tained in the concentrates. If desired, the concentrates may now be treated in any suitable way for the final and complete separation of the metal, or instead the concentrates may be concentrated by successive crushing and screening operations, as explained, so as to obtain a very much richer product. While I have referred herein to the importance of feeding the material to the rolls in the several recrushing operations, in the form of a sheet, substantially only a single particle thick, the same precaution can with good results be observed in connection with the first crushing operation, although I do not consider it so necessary as in connection with the succeeding recrushings. Although I have described my improved process in connection with the concentration of arsenical cobalt silver ores, it will be understood that it may be successfully carried out in connection with any ores carrying free metal in the proper form and in sufficient quantity to warrant the expense, the important consideration being that the metal should exist in such condition that when subjected to a crushing effect, the bulk of the non-metallic material will be reduced in size, while the area of the metallic particles will be increased to permit separation by screening operations, as explained.

Quoted

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is as follows:

1. The process of concentrating ores, containing free metallic granules, such as arsenical cobalt silver ores, which consists in crushing the ore to a predetermined maximum size, whereby the non-metallic material will be crushed and a portion of the metallic granules will be

12/8/8

increased in area, and in finally subjecting the crushed material to a screen whose mesh is substantially equal to the maximum size of the non-metallic particles, whereby the bulk of the material will pass through the same, leaving in the small proportion of tailings, an increased percentage of the metallic granules, substantially as and for the purposes set forth.

2. The process of concentrating ores, containing free metallic granules, such as arsenical cobalt silver ores, which consists in subjecting the ore in a very thin sheet, ^{substantially only a single particle thick} to a crushing effect, so as to reduce the same to a predetermined maximum size, whereby the non-metallic material will be crushed, and a portion of the metallic granules will be increased in area, and in finally subjecting the crushed material to a screen whose mesh is substantially equal to the maximum size of the non-metallic particles, whereby the bulk of the material will pass through the same, leaving in the small proportion of tailings, an increased percentage of the metallic granules, substantially as and for the purposes set forth.

3. The process of concentrating ores, containing free metallic granules, such as arsenical cobalt silver ores, which consists in subjecting the ores to successively finer crushing operations, whereby the non-metallic particles will be gradually reduced in size, while at each pass, a portion of the metallic granules will be increased in area, and in subjecting the crushed material, after each crushing action to a screening operation, permitting the bulk of the material to pass the same, and leaving in the small proportion of the tailings of each screening operation an increased percentage of the metallic granules, substantially as and for the purposes set forth.

2/8/08

4. The process of concentrating ores, containing free metallic granules, such as arsenical cobalt silver ores, which consists in subjecting the ore in the form of a very thin sheet, ^{substantially only a single leaf thick} to successively finer crushing operations whereby the non-metallic particles will be gradually reduced in size, while at each pass a portion of the metallic granules will be increased in area, and in subjecting the crushed material, after each crushing action, to a screening operation, permitting the bulk of the material to pass the same, and leaving in the small proportion of the tailings of each screening operation an increased percentage of the metallic granules, substantially as and for the purposes set forth.

5. The process of concentrating ores containing free metallic granules, such as arsenical cobalt silver ores, which consists in crushing the ore to a predetermined maximum size, then in subjecting the crushed material to a screen whose mesh is substantially the same maximum size, whereby the bulk of the material will pass the same, leaving in the small proportion of tailings an increased percentage of the metal, then in subjecting the screened material to a recrushing operation to further reduce the size of the non-metallic portion thereof, and to increase the area of a portion of the metallic particles, and in finally subjecting the recrushed material to a finer screening operation, whereby a further concentration takes place, substantially as and for the purposes set forth.

12/6/08

6. The process of concentrating ores, containing free metallic granules, such as arsenical cobalt silver ores, which consists in crushing the ore to a predetermined

maximum size, then in subjecting the crushed material to a screen whose mesh is substantially the same maximum size, whereby the bulk of the material will pass the same, leaving in the small proportion of tailings an increased percentage of the metal, then in subjecting the screened material in the form of a very thin stream, substantially only a single particle thick, to a finer recrushing operation to further reduce the non-metallic portion thereof and to increase the area of a portion of the metallic particles, and in finally subjecting the recrushed material to a finer screening operation, whereby a further concentration takes place, substantially as and for the purposes set forth.

Substantially as and for the purposes set forth.

This specification signed and witnessed this 28 day of Dec 1906

Thos. A. Edison

Witnesses:

1. James L. Dwyer
2. James R. Nelson

Oath.

State of New Jersey }
County of Essex } ss.,

THOMAS ALVA EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Orange, County of Essex and State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the improvements in PROCESS OF CONCENTRATING SILVER ORES,

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Thos. A. Edison

Sworn to and subscribed before me this 28 day of Dec. 1906

James L. Dwyer

[Seal]

Notary Public.



Fig. 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Fig. 2



Fig. 3

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Fig. 4



Fig. 5

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Fig. 6

Witnesses:
Wm. H. R. R. R.

Inventor:

John

2/8⁰
Dec.31, 1906

Honorable Commissioner of Patents,
Washington, D. C.

S i r :--

Enclosed please find check for fifteen dollars
(\$15.00) filing fee together with specification in the
application of Thomas A. Edison, PROCESS OF CONCENTRATING
SILVER ORES.

Kindly acknowledge receipt.

Respectfully,

FDL/AJL

2-179.

All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

J. W. T.

DEPARTMENT OF THE INTERIOR,

United States Patent Office,

Washington, D. C., Jan. 2, 1907

Sir:

I have to acknowledge the receipt of your informal application for patent, the title of which is improvement in Process of Concentrating Silver Ores

This application is informal because a diagrammatic drawing is required by the Examiner.

Very respectfully,

Thomas A. Edison,
c/o Frank J. Dyer,
Edison Laboratory,
Orange, N. J.

F. J. Allen

Commissioner of Patents.

NOTE.—In order to constitute an application for a patent, the inventor is by law required to furnish his petition, specification, oath, and drawings (where the nature of the case admits of drawings) and to pay the required fee.

No application is considered complete, nor can any official action be had thereon, until all its parts, as here specified, are furnished in due form by the inventor or applicant.

22180-100-06

HONORABLE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

S I R : --

Regarding the alleged informal application of Thomas A. Edison for PROCESS OF CONCENTRATING SILVER ORES, referred to in your letter of the 2nd inst., it is respectfully submitted that the practice which has heretofore been followed in similar cases should be followed in the present case, i.e. that the application should be accepted, referred to the primary examiner, and upon the request of the latter to furnish a drawing, the question could then be presented by petition to the Commissioner in person. In the present case it is not thought that a drawing is necessary, but as the invention is important and as applicant does not wish to delay obtaining a definite date of application, a drawing is submitted herewith. I request, therefore, that the application be amended as follows:

a Insert at the end of the specification on page 5,

-- In order that the invention may be more fully understood, attention is directed to the accompanying drawing illustrating a suitable apparatus in connection with which the process may be carried into effect. In this drawing Figure 1 is a diagrammatic sectional view of the apparatus illustrating the crushing rolls in the position for the first pass; Figure 2, a plan view of one of the screens for screening the material after the first crushing operation; Figure 3, a view similar to Figure 1, showing the crushing rolls in position for the second pass; Figure 4, a plan view of one of the screens for screening the material after the second crushing oper-

ation; Figure 5, a view similar to Figures 1 and 3, showing the crushing rolls in position for the third crushing operation, and Figure 6, a plan view of the screen for screening the material after the third crushing operation. In these views corresponding parts are represented by the same numerals of reference.

1 represents a hopper in which the material is placed; 2 a roller feed for delivering material from the hopper in a very thin, wide stream; 3-3 are the crushing rolls; 4-4 represent a series of screens located below the crushing rolls for screening the product delivered therefrom; checking shelves 5 are used to check the velocity of the material passing over the screens so as to secure a maximum screening effect. The screens as shown (see Fig.2) are preferably provided with elongated slots which I have found permit of a much more perfect screening operation than if round or rectangular holes are used as with ordinary screens. Screens of this character are fully disclosed in my patent No.675,057 dated May 28, 1901, to which reference is directed for details of construction.

As shown, the width of the screening slots is substantially equal to the distance between the crushing rolls whereby the greater bulk of the material crushed passes through the screens, while the tailings will contain any larger metallic particles whose area may have been increased by the crushing operation. The tailings are carried off by conveyor 6 while the screenings may be delivered by conveyor 7. In Figure 3, the crushing rolls 3-3 are shown as being set somewhat closer together so as to effect a further reduction. These may be the same rolls as shown in Figure 1, or a second set of rolls.

In the latter case the screenings from the conveyor 7 may be delivered to the hopper 1 of the second rolls by a conveyor 8 indicated in dotted lines. The screens for use with the second set of crushing rolls as shown in Figure 4 are provided with slots substantially equal to the distance between the rolls whereby the small proportion of tailings will contain the enlarged metallic particles whose area may have been increased by the rolls. In Figure 5, the rolls 3-5 are shown as being still closer together so as to effect the further reduction, while the screens for use therewith, as shown in Figure 6, are provided with slots equal substantially to the distance between the rolls. These rolls, if desired, may be an independent set of rolls or they may be the same rolls as in Figure 1 which have been adjusted more closely together. In the former case the screenings from the second set of rolls may be conveyed to the hopper of the third set by means of a conveyor 9 shown in dotted lines. --

In view of the above amendment it is hoped the case may now be accepted by the Office.

Very respectfully,

THOMAS A. EDISON

By Francis C. Dyar

His Attorney

Orange, New Jersey

January 14 1907.

M.E.C.

2-260.

Div.....25 Room..... 315
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

Paper No. 2.....

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

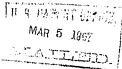
WASHINGTON, D. C.,

March 5, 1907.

Thomas A. Edison,

Care Frank L. Dyer,

Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application.

#352,417, filed January 15, 1907, for Process of Concentrating Silver
Ores.

P. J. Allen
Commissioner of Patents.

Whatever there may be of process set forth in the claims in this
case, is old in 229,669, Burgess, July 5, 1880, Ore and Coal,
Washers, H, and the claims are accordingly rejected. Applicant
has merely duplicated the steps of the Burgess process, in which
there is no invention. Moreover, the claims are anticipated
in 162,157, Downton, April 20, 1875; also in 267,016, Prinz, Nov.
7, 1882, Flour Processes.

Examiner, Div. XXV.

IN THE UNITED STATES PATENT OFFICE.

Thomas A. Edison)	
PROCESS OF CONCENTRATING)	
SILVER ORES)	
Filed January 15, 1907	)	Room No. 315
Serial No. 382,417)	

HONORABLE COMMISSIONER OF PATENTS:

S I R :--

It is respectfully submitted that the rejection of the claims contained in the Examiner's communication of March 5, 1907 should be reconsidered and the claims allowed.

The invention of this application is based upon the discovery by the applicant that the special ores operated upon contain particles of silver in its free metallic state. This fact is believed to have been unknown before its discovery by the applicant, as no reference has been cited to show that this fact was formerly known, but even if known, the question of patentability would not be affected. Of course the applicant is not entitled to a patent for this discovery, but the process by which he takes advantage of the discovery to recover the silver found to exist in the ore in its free metallic state, is the proper subject matter for a patent. The claims are drawn to cover this process and it is believed that they should therefore be allowed.

Of the reference patents, those relating to flour milling are not in any way pertinent to the present subject matter, and it is believed that in considering the patentability of this application, these patents cannot be

considered as constituting any part of the prior art. The only patent which appears to have any pertinency whatever in the patent to Burgess, No. 238,668, which covers a process of separating graphite from foreign matter. The material upon which Burgess operated was fine sand or gravel containing particles of graphite. Applicant operates upon a composite body of ore which is substantially rock and which applicant has discovered to contain particles of free silver. It is submitted that a person who had nothing before him except this patent to Burgess, for separating graphite from sand and gravel, would obtain therefrom no suggestion as to how to proceed to recover the free particles of silver in the rock masses of the ore in which it is found. This is the more apparent since metallurgists have had access to the disclosure of the Burgess patent for nearly thirty years, and so far as applicant knows and believes, and so far as the record of this case discloses, no one has heretofore conceived or adopted the process of recovering silver from the ore which forms the subject matter of this application.

If the Examiner will attempt to read the claims of this application upon the Burgess patent, he will see that the claim is already limited beyond the disclosure of that patent, and contains a number of steps not disclosed in the patent. This is necessarily true because of the difference in the materials operated upon. It seems apparent, therefore, that the applicant has discovered a new scientific principle, which he can protect only by claims for the process in which that principle is successfully made use of; that the Burgess patent is designed to operate upon a material which is of a very different nature from the material operated upon by the present applicant; that this patent contains no suggestion of the process to be prac-

ticed upon such different material; that although the Burgess patent has been before mineralogists for upwards of twenty-five years, no one has heretofore thought of applying or applied this principle to the recovery of silver from the ore; and that the claims as already submitted are not readable upon the disclosure of the Burgess patent, and for these reasons it is submitted that the Examiner should reconsider and allow the claims in their present form, and such action is respectfully requested.

THOMAS A. EDISON

By

Frank L. Dyer

His Attorney.

Orange, New Jersey

November 25th 1907.

REC

2-260.

TFM

Div. 25 Room 315
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

Paper No. 4

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

December 12, 1907.

Thomas A. Edison,

Care Frank L. Dyer,

Orange, N.J.

DEC 12 1907

Please find below a communication from the EXAMINER in charge of your application.

No. 352,417, filed January 15, 1907, for Process of Concentrating
Silver Ores.


E. B. Moore

Commissioner of Patents.

Case as argued November 26, 1907, further considered.

The claims are rejected as destitute of invention in view of
28,499, Parrott, May 29, 1860; 644,180, Lane, February 27, 1900,
Crushing Rolls, D; and 644,181, Lane, Feb. 27, 1900, Separators,
Dry, and the references of record. There is no invention in the
application of the step by step process of reduction with intervening
separation by screening, in view of the references.

Examiner, Division XXV.



IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison
PROCESS OF CONCENTRATING
SILVER ORES

Filed January 15, 1907

Serial No. 352,417

Room No. 315

HONORABLE COMMISSIONER OF PATENTS:

S I R :

In response to Office action of
December 12, 1907, please amend the above entitled case
as follows:

Cancel Claims 1, 3 and 5 and renumber Claims 2, 4
and 6 as 1, 2 and 3 respectively.

Add the following claims:

- 4. In apparatus for concentrating ores containing
free metallic granules, the combination of a series of
crushing rolls, through which the ores are successively
passed, the gap between each pair of rolls in the series
successively diminishing in width, means for feeding the
ores through the various pairs of rolls, adjusted to allow
the ore to be fed therethrough only in a thin, wide stream,
and screens interposed between the pairs of rolls of the
series, having elongated slots of a width in each case sub-
stantially the same as that of the gap between the pair
of rolls above the same, substantially as set forth.

5. In apparatus for concentrating ores containing
free metallic granules, the combination of a series of

crushing rolls, through which the ores are successively passed, the gap between each pair of rolls in the series successively diminishing in width, means for feeding the ores through the various pairs of rolls, adjusted to allow the ore to be fed therethrough only in a thin, wide stream, and screens interposed between the pairs of rolls of the series, having elongated slots of a width in each case substantially the same as that of the gap between the pair of rolls above the same, and means for conveying the material which passes each screen to the feed for the next pair of rolls, substantially as set forth. -

R E M A R K S

The process claims remaining in the case are thought to patentably distinguish from the references in that each one of the same is limited to the process of subjecting the ore in the form of a very thin sheet or stream to the various crushing operations. This idea of so regulating the feed that the ore shall pass through the rolls in a thin stream substantially only a single particle thick, is of particular value in this connection, since thereby the metallic particles which are flattened by their passage through the rolls, are not likely to be broken by being pressed between particles of the ore. The two claims newly added are thought to patentably distinguish in the specific details of the apparatus shown for carrying out applicant's process.

Reconsideration and allowance of the whole case are requested.

Respectfully submitted.

THOMAS A. EDISON

Orange, New Jersey

By

Frank L. Over

December 8, 1908.

His Attorney

MEC

2-280.

TFM

" Div. 25 Room 315

All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

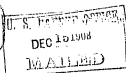
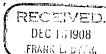
Paper No.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C., Dec. 15, 1908.

Thos. A. Edison,
c/o Frank L. Dyer,
Orange, N.J.



Please find below a communication from the EXAMINER in charge of your application.

No. 352,417, filed Jan. 15, 1907, for Process of Concentrating Silver
Ores.

E. B. Moore

Commissioner of Patents.

Case as amended December 10, 1908, further considered.

Applicant is required to file a new oath, the present
oath being defective in that it is not broad enough to include the
apparatus now claimed, and in that it is attested by a notary public
who is applicant's attorney in this application. See opinion of the
Attorney General, 127 O.G. 3642; and The Hall's Safe Co. v. Herring,
- Hall-Marvin Safe Co., 135 O.G. 1804. The amendment to the code of
the District of Columbia on which said opinions are based, was
approved June 29, 1906, and hence applies to the oath in this
application which was executed six months subsequently.

The question of division or the propriety of admitting
apparatus claims where a drawing did not form part of the application
as originally filed, is not entirely free from doubt and consideration
will be deferred.

The 1st 2nd and 3rd claims are rejected in view of the
references of record, the manner of feed not rendering the process
a patentably different one, involving as it does substantially only
difference of degree and regulation dictated by judgment over the
ordinary feed, it being usual to feed in a thin sheet to crushing
rolls (see 229,669, Burgess, of record - line 42; 245,463, Duvall,
August 9, 1881, Feed Regulators, B; and 287,126, Hecker, Oct. 23,

352,417 - 2

1883, Feed Regulators, B.)

Claim 4 is rejected in view of Prinz of record, the references cited above, and the screen of applicant's patent 675,057, May 28, 1901, Sifters and Screens, A.

Claim 5 is rejected in view of the same. This claim and the 4th express a mere aggregation of elements old in the prior art in the same sequence as in Prinz.

For further view of prior art, see the feeder and the screen U of 637,327, Edison, November 21, 1899, Crushing Rolls, B.

Examiner, Div XXV.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison :
PROCESS OF CONCENTRATING :
SILVER ORES : Room No. 315.
Filed Jan. 15, 1907 :
Serial No. 352,417 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of December
16, 1908, please amend the above entitled case as follows:

✓ Page 1 of the Specification, line 4, insert -
and apparatus for - before "concentrating".

✓ Claim 1, line 4, after "sheet" insert -
substantially only a single particle thick - .

✓ Claim 2, line 4, after "sheet" insert -
substantially only a single particle thick - .

✓ Claim 4, line 7, after "stream" insert -
substantially only a single particle thick - .

✓ Cancel Claim 5.

R E M A R K S

Applicant will file a new oath as required by
the Examiner before the application goes to issue.

Reconsideration and allowance of the claims as
now amended are respectfully requested. None of the
references discloses a process for concentrating ores

containing free metallic granules, which consists in passing the ore through a series of crushing operations so arranged that the non-metallic material will be crushed and these metallic granules which are sufficiently large will be increased in area each operation and screened out, the ore being fed to the crushing means in a very thin stream or sheet of substantially the thickness of only a single particle of the material. By this means the metal is recovered by purely mechanical means without loss from breakage such as would occur if the material were fed in a thicker stream. Of the references cited by the Examiner to show that it is old to feed material in a thin sheet to crushing rolls, one reference, Burgess, has to deal with a non-metallic material, graphite, while the other references refer to flour milling, which is an entirely non-analogous art, and in which it is not an object to prevent the breaking up of the particles crushed as in applicant's case. Furthermore, the process of running the material repeatedly through crushing rolls in a thin stream as specified, to increase the area each time of such metallic granules as have previously passed through the crushing rolls to separate out the same, is new. Claim 4, drawn to apparatus, is thought to be patentable for the reasons just advanced in the case of the process claims. None of the references discloses rolls which are adjusted to allow the ore to be fed there-through only in a thin wide stream of substantially the thickness of one particle. Claim 5 has been canceled as unnecessary. Final action is requested.

Respectfully submitted.

THOMAS A. EDISON

By

Frank L. Lyon
Attorney

Orange, N. J.

December 14, 1909.

180

Div. 25... Room 315

ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

MHC

2-260.

TFM

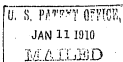
Paper No. 8

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C. Jan. 11, 1910.

Thomas A. Edison,
c/o Frank L. Dyer,
Orange, N.J.



Please find below a communication from the EXAMINER in charge of your application,
No. 359,417, filed Jan. 15, 1907, for process of Concentrating
S. Silver Ores.

E. B. Moore

Commissioner of Patents.

Case further considered as amended Dec. 15, 1909.

The question of division will not be raised, it appearing
that the process and apparatus may be joined in this particular
application. The reference to a drawing in the office letter of
Dec. 15, 1908, was unwarranted, since a drawing was filed on Jan. 15,
1907, the date of completion of the application. This was over-
looked because of a pencil notation by the application clerk on the
face of the file obscuring the subsequent entry of a drawing.

The remaining defect, as to the oath not including an
apparatus, will, it is presumed be cured when the new oath is
supplied.

The claims are rejected as destitute of invention in view
of the references of record. The distinctions over the process
of Lane lie in the regulation of the feed to rolls and screen mesh;
and in view of the fact of the necessity of a thin feed to the
crushing rolls in a strictly analogous process being disclosed
in Burgess, it does not appear that the specific degree of
regulation makes the process patentably different from Lane's. (See
the last line, page 1, of applicant's patent #675,057; and
the last paragraph, page 3, and lines 30-45, page 4, of applicant's
patent #637,327).

*Amended
Smith*

752,417 - 2

The apparatus claim (the 4th) involves the interposition of screens such as are disclosed in applicant's patent #637,327, between each of a series of rolls such as those of Lane, #644,180. In view of lines 3--12, page 2 of said Lane patent, such arrangement does not appear to involve more than judicious selection from the prior art; while the feed adjustment is a common feature disclosed in applicant's own patent #637,327. Feeders for adjusting the thickness of feed being old and common, the specific degree of adjustment, which is merely one of the capabilities of the machine, does not make the machine patentably different.

Examiner, Div. 25.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)	
PROCESS OF CONCENTRATING)	
SILVER ORE	)	Room No. 315.
Filed January 15, 1907)	
Serial No. 352,417)	

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to the Office action of January 11, 1910, please amend this application as follows:-

In the fourth line from the bottom of page 2, change "tailings" to - screenings - .

R E M A R K S

Applicant will file a new oath as required by the Examiner before the application goes to issue.

Reconsideration and allowance of the claims in their present form are respectfully requested. None of the references discloses a process for concentrating ores containing free metallic granules, which consists in passing the ore through a series of crushing operations so arranged that the non-metallic material will be crushed and those metallic granules which are sufficiently large will be increased in area each operation and screened out,

the ore being fed to the crushing means in a very thin stream or sheet of substantially the thickness of only a single particle of the material. That portion of applicant's prior patent No. 675,057 referred to particularly by the Examiner, namely, the last line of page 1 of said patent, discloses the feeding of the material in a stream having a uniform thickness of one or two particles. The object of having such a thickness is to secure satisfactory screening. In this patent, the material is not fed to crushing rolls at all. In the process set forth in Claims 1 to 3 inclusive of this application, the material is fed to crushing rolls in a very thin sheet substantially only a single particle thick, and the object of this is to prevent the flattened metallic granules from being broken up between the ore particles during the reduction of the latter. See the sentence beginning in the 4th line from the bottom of page 3 of this application. Applicant had no such object in view in his prior patent No. 675,057. The Examiner ~~xx~~ also referred to the last paragraph, page 3, and lines 30 to 45, page 4, of applicant's prior patent No. 637,327. This patent merely states that the ore is fed in a stream of even thickness, and the material is fed to the crushing rolls as fast as they can take care of it. In the present application, by feeding the ore to the rolls in thin sheets substantially only a single particle thick, a new result is attained, which was not contemplated in the prior patents Nos. 637,327 and 675,057.

While in the patent to Burgess, No. 229,669, the material is fed to the crushing rollers in a thin

stream, there is no disclosure of the regulation of such thin stream to the specific thickness which is set forth in these claims. Inasmuch as a new and useful result is obtained by having the material of this specific thickness, it is believed that this limitation constitutes a patentable distinction. The patents to Lane Nos. 644,180 and 644,181 do not disclose the feeding of the material in a thin sheet. Neither do these patents show a screen for each set of rolls. For the reasons set forth above and also in the remarks accompanying prior amendments, it is believed that Claims 1, 2 and 3 covering the process should be allowed.

Referring to Claim 4 which relates to the apparatus used in carrying out the process, it is noted that none of the references shows the means for feeding the ores through the various pairs of rolls adjusted to allow the ore to be fed therethrough only in a thin wide stream substantially only a single particle thick. The advantage of this ~~particular~~ ^{particular} thickness has been discussed above and is set forth in the specification. Furthermore, in this claim, the arrangement of ^{the} screens is set forth and the relation between the widths of the screen openings and the gaps between the pairs of rolls is stated.

It is believed that the claims now in the case cover an invention of merit which is patentable over the references. An allowance of these claims is therefore earnestly requested. If, however, the Examiner again rejects these claims, he is asked to make his action final, in order that applicant may have an opportunity to appeal.

Respectfully submitted,

Orange, N. J.

December 19, 1910.

THOMAS A. EDISON

By Frank A. Jones
His Attorney

280
Div. 25, Room 315

MEC

2-280

TELE

Paper No. 10

Address only
The Commissioner of Patents,
Washington, D. C.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON Jan. 3, 1911.

Thomas A. Edison,

c/o Frank L. Dyer,

Orange, N.J.

Please find below a communication from the EXAMINER in charge of your application.

No. 382,417, filed Jan. 15, 1907, for Process of Concentrating
Silver Ores.

E. B. Moore.

Commissioner of Patents.

This application further considered as amended and
argued Dec. 20, 1910.

The claims are again and finally rejected for reasons and
upon the references stated in the last office letter. If the
smaller particles are removed by screening and the larger particles
are delivered with spaces between them (line 21, 42, page 4 of #637,
therein 327, Edison), to rolls, it appears that applicant discloses the
feeding of the material in a layer a single particle thick to the
rolls (and see "having a uniform thickness of one or two
particles", last line, page 1, and first line, page 2 of
#675,057, Edison of record). It is held not to involve invention
to apply this manner of feed in Burgess or Lane of record.

The formal requirements must be complied with before appeal.

Examiner, Div. 25.

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON)
PROCESS OF CONCENTRATING)
SILVER ORES)

Filed January 15, 1907)

Serial No. 352,417)

Room No. 315.

HONORABLE COMMISSIONER OF PATENTS,

S I R :

The accompanying oath is filed in
the above entitled case in order to put the same in con-
dition for appeal.

Respectfully,

THOMAS A. EDISON

By Frank L. Dyer
His Attorney.

Orange, New Jersey,

January 17, 1911.

State of New Jersey, }
County of Essex. } ss.

THOMAS ALVA EDISON, who on or about January 15, 1907, filed in the United States Patent Office, Application Serial No. 352,417 for Letters Patent for Improvements in PROCESS OF CONCENTRATING SILVER ORES, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Orange, County of Essex and State of New Jersey; that he verily believes himself to be the original, first and sole inventor of the improvements in PROCESS OF AND APPARATUS FOR CONCENTRATING SILVER ORES, described and claimed in the said application; that he does not know and does not believe that the same was ever used or known before his invention thereof; or patented or described in any printed publication in the United States of America, or any foreign country before his invention or discovery thereof, or more than two years prior to said application; or patented in any country foreign to the United States on an application filed more than twelve months prior to said application; or in public use or on sale in the United States for more than two years prior to said application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country prior to said application.

Thos. A. Edison

Sworn to and subscribed before me this 17th day of

January 1911.

(Seal)

Anna P. Keck

Notary Public.

Div. 25... Room 315 HPC

2-300

TFM

Paper No. 12

Address only
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON Jan. 21, 1911.

280
Thomas A. Edison,
c/o Frank L. Dyer,
Oranget, N.J.

Please find below a communication from the EXAMINER in charge of your application.

No. 352,417, filed Jan. 15, 1907, for Process of Concentrating
Silver Ores.

E. B. Moore

Commissioner of Patents.

This application further considered as brought up by
letter and oath filed Jan. 19, 1911.

The filing and entry of the oath place this
application in condition for appeal.

Examiner, Div. 25..

December 22, 1911.

Mr. Edison:-

FOLIO 280 - PROCESS OF CONCENTRATING SILVER ORES

The claims in this application have been finally rejected. If the application is to be prosecuted further, an appeal must be taken.

The principal references are the patents to Burgess, No. 229,669 and Lane, No. 644,180.

The patent to Burgess shows a process of separating graphite from foreign mineral matter, which consists in flattening the graphite and pulverizing the foreign mineral, and separating the flattened flakes of graphite from the pulverized mineral by screening.

The patent to Lane shows apparatus for separating malleable metals, particularly copper, from the rock, sand or gravel with which they are mixed as found in nature. The mixture is passed between a series of rolls, the distance between the rolls of each pair being a trifle less than the distance between the rolls of the pair preceding it in acting upon the material. Screens are provided at intervals for separating the flattened metal particles from the crushed rock, etc. See particularly Fig. 1.

The claims in your application in their present form are all limited to feeding the material in a thin stream substantially only a single particle thick. There is a fair chance of securing the allowance of some claims over the references, inasmuch

Mr. Edison - #2

as the references do not show means for controlling the thickness
of the stream of material fed to each successive pair of rolls.

Do you wish us to take an appeal on this case?

Legal Department.

HL-JS

Sanahan

Mr. Edison instructed me to drop the case.
He looked at the patent to Lane, & said "that
kills it."

HL

Dec 22, 1911

Folio No.

282

Serial No.

521,490

Applicant.

Dor. A. Edison.

Address.

Orange N.J.

Title

Phonographic Recording Stylus

Filed

Jan 3, 1907

Examiner's Room No.

577

Assignee

New Jersey Patent Company
vs. H. Edison, Inc.

Ass't Exec.

Nov 26, 1907
Dec. 7, 1911.Recorded Dec 27, 1907
Dec. 9, 1911.Liber. 878
288Page 39
416

(in Folio 281)

Patent No. 1024839

Issued

Apr. 30, 1912

ACTIONS.

1. Office letter Jan 24 1907 16
2. Amended June 18, 1908 17
3. Allowed July 29, 1908 18
4. Fee taken up Nov 29 1909. 19 This case forced to be taken up before Dec 1909
5. Final fee due July 29 1908 20
6. Renewed Oct. 7, 1909 21
7. Rejection Oct. 19, 1909. 22
8. Amended October 7, 1910. 23 No foreign appeal as
9. Rejected Nov 8, 1910 24 per advice F.L.D. 11/27/11.
10. Amended Oct. 25, 1911. 25 R.P.R.
11. Allowed Nov 25, 1911. 26
12. Final fee due May 24 1912 27
13. " " paid April 1, 1912. 28
14. 29
15. 30

PAID

FRANK L. DYER,

Counsel,

Orange, New Jersey.

Revised #1. A recording stylus comprising a
shank and a disk-like head
~~having~~ ^{increasing in thickness} from its periphery
toward its center and formed with
a notch to present a cutting edge.

Add claims -

A recording stylus consisting of a
jewel ~~formed with~~ ^{having} a rounded periphery
and ^{formed with} a notch ^{which presents} a substantially



~~about~~ circular cutting edge ~~of~~
~~less than~~ having a diameter ^{less}
than two ~~to~~ one-hundredths
of an inch -

(4) limited to jewel + size -

Folio No. 896Serial No. 260,313

Applicant.

Address.

Thos. A. Edison,Title Process for Duplicating Talking Machine RecordsFiled March 4, 1907Examiner's Room No. 379

Assignee

Ass'g't Exec. _____ Recorded _____ Liber. _____ Page _____

Patent No. 975,339 Issued Nov. 8, 1910

ACTIONS.

- 1 Rejected April 4, 1907 16
- 2 Amended March 28, 1908 17
- 3 Rejected Apr 7, 1908 18
- 4 Amended Apr 2, 1909 19
- 5 Rejected Apr 24, 1909 20
- 6 Amended Apr 22, 1910 21
- 7 allowed May 10, 1910 22
- 8 Final for dist Nov 10, 1910 23
- 9 " " pd. Oct 6, 1910 24
- 10 _____ 25
- 11 _____ 26
- 12 _____ 27
- 13 _____ 28
- 14 _____ 29
- 15 _____ 30

FRANK L. DYER,
Counsel,
Orange, New Jersey.

179th. 907 700

The object of this invention is to produce ~~multiple~~ Records for the duplication of disk records for jacking in a

The invention consists in ~~graphite~~ coating the surface of the master record with a thin layer of graphite ~~or other material of like nature~~ which is not ^{graphite} water repellent or coating with a metal of known ^{superior} ~~material~~ in a ring, face up & pouring over this a thick emulsion of extremely finely divided Portland Cement, & allowing the same to set, detaching the master record therefrom & after scavenging using the Portland Cement record

2

to multiply records from plastic material by compression -

The matrix is not affected by heat or is ~~less~~ harder than metallic matrices now commonly used - There are other cements not affected by heat but none so ~~readily~~ available as Portland Cement, ^{such as rockwool & zinc} magnesia etc.

The Cement may be mixed in different proportion with very finely divided inert material not affected by heat, which will even cause the matrix to be harder - It is preferable to use the Cement in an impalpable form as fine as the graphite usually used for coating the matrices for electrolytic work -

extremely finely divided ~~silica~~
Matrix not destroyed

Addition to Cement Masher for disk
success -

Where rapid matrix is desired
a cement composed of Oxide of
Zinc & glacial phosphoric
acid may be used as it
hardens in a few minutes &
like Portland Cement it is
not appreciably effected
by the heat of the warm
plastic material used
for the duplication - it
however not so lasting as
well seasoned Portland
The proportions of the oxide & acid
can be greatly
varied, ~~the~~ This Cement is
generally used by Dental

Folio No. 314

Serial No. 372,919

Applicant.

Address.

Thomas A. Edison
Llewellyn Park
West Orange N.J.

Title Electrolytes for Alkaline Storage Batteries

Filed May 10, 1907 Examiner's Room No.

Assignee Edison Storage Battery Company

Ass'g't Exec. June 20, 1907 Recorded June 25, 1907 Liber P. 76 Page 481

Patent No. 876,445 Issued Jan. 14, 08.

ACTIONS.

1 Allowed Jan. 17, 1907 16
2 Final fee paid Dec. 11, 1907 17
3 18
4 19
5 20
6 21
7 22
8 23
9 24
10 25
11 26
12 27
13 28
14 29
15 30

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Improvements in Alkaline Electrolytic Solutions ~~for alkaline Batteries~~

The object of this invention is to increase the storage capacity of the nickel hydroxide element in Nickel Iron Storage Batteries employing an alkaline electrolyte and also to maintain this capacity over long periods of time.

The invention consists in employing with the ~~same~~ solution of Potassium or Sodium Hydroxide of a small quantity of Lithium

2

hydroxide, to solutions of either Sodium or Potassium Hydroxide, about 2 per cent of Lithium Hydroxide is added.

By chemical reactions not now known the effect of the Lithium is very striking increasing the capacity about 10% - or what is more important serves to maintain the capacity notwithstanding the deleterious action of ~~the reaction~~ of the iron dissolved ~~into~~ into the electrolyte from the iron electrode & the impurities which in small traces are always present in chemical compounds used commercially.

Claim an electrolyte for
alkaline Batteries,
Consisting of Potassium
or Sodium Hydroxide
Solutions containing
Lithium Hydroxide -

7119

P.A.E

Electrolytes for Alkaline Storage Batteries

In the experimental and commercial development of alkaline storage batteries of the Edison ^{type} the difficulties which have been encountered have been confined very largely to the depolarizing electrode ^{combination with} in which nickel hydroxide is used. The storage capacity of the nickel element has been less than that of the iron element and the capacity of the nickel element ~~cannot~~ ^{can not} be maintained for so long a ~~throughout the long~~ ^{prolonged} periods of time as the iron element. Furthermore, the nickel hydroxide as an active material is seriously affected by any iron from the other electrode that may be dissolved in the electrolyte as well as by impurities which in trace amounts are inevitably present in cheap base materials when used even in small quantities.

My invention is based on the discovery that the capacity of the nickel hydroxide can be materially increased, while at the same time the capacity will be maintained for longer periods, by adding to the alkaline electrolyte a small proportion of lithium hydroxide. The electrolyte may be a solution of sodium or potassium hydroxide,

2/

The preferred amount of lithium hydroxide employed is about 2% by weight of the sodium or potassium hydroxide solution; but the proportion may be varied more or less on either side of this quantity. The increase in capacity of an Edison cell in which lithium hydroxide is used, amounts to about ten per cent, while the ^{increase of the time over which} ~~the amount of the~~ capacity ~~thereby over a longer period may be~~ maintained is remarkable, and of the highest commercial importance.

I am not able to explain why the addition of lithium hydroxide as explained to the electrolyte shows marked as such striking and noticeable phenomena.

Having now etc -

- (1) An alkaline electrolyte for storage batteries, employing a small quantity of lithium hydroxide substantially as set forth
- (2) An alkaline electrolyte for storage batteries, employing about two percent of lithium hydroxide, substantially as set forth
- (3) A storage battery employing as active materials compounds of nickel and iron, and an alkaline electrolyte containing lithium hydroxide, substantially as set forth.

Folio No. 320

Serial No. 376,619

Applicant.

Address.

Thomas A. Edison

Title Filaments for Incandescent Electric Lamps

Filed May 31, 1907

Examiner's Room No. 107

Assignee General Electric Co.

Ass'g't Exec. Ct. 11, 1915 Recorded

Liber

Page

Patent No. 1,163,329 Issued Dec. 7, 1915

ACTIONS.

- | | | |
|-----------------------------|----|-----------------------------|
| 1. Rejected Aug. 6, 1907 | 16 | Final Fee due Nov. 25, 1913 |
| 2. Amended Aug. 4, 1908 | 17 | " " Paid Dec. 10, 1913 |
| 3. Rejected Oct. 20, 1908 | 18 | |
| 4. Amended Oct. 13, 1909 | 19 | |
| 5. Rejection Jan. 6, 1910 | 20 | |
| 6. Amended Dec. 17, 1910 | 21 | |
| 7. Rejected Jan. 20, 1911 | 22 | |
| 8. Amended Jan. 16, 1912 | 23 | |
| 9. Rejected Feb. 27, 1912 | 24 | |
| 10. Amended Feb. 25, 1913 | 25 | |
| 11. Rejected April 26, 1913 | 26 | |
| 12. Amended Apr. 23, 1914 | 27 | |
| 13. Rejected May 26, 1914 | 28 | |
| 14. Amended May 27, 1915 | 29 | |
| 15. Allowed May 28, 1915 | 30 | |

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Dyer

Revised
May 14/07
gld

14th May 1907

2

The object of this invention is to obtain homogeneous filament of pure metallic Tungsten for incandescent lamps -

The invention consists in using an ~~electrode~~ ^{electrode} formed of pure powder of Metallic Tungsten ~~comp~~ by compression - placing the same in a vacuum free from oxygen or of a proper character to permit of a glow discharge & volatilizing the tungsten as a vapor which proceeds from the ~~electrode~~ ^{electrode} in straight lines & is deposited as a film of the desired thickness -

on flat surfaces such as Wax ~~thin~~ & other suitable material - The sheet thus formed is then cut in strips of proper width bent into the form of filaments & used in incandescent electric lamps. As the homogeneity is perfect the filament may be many times thinner than that it is possible to form it mechanically by using Tungsten powder mixed with binders & forcing the same through dies to form a filament hence lamps of high voltage & low candle power can be made which

by present processes
is impossible - other metals
such as Tantalum can be used

The vacuum process of
forming films is more preferable
shown in my patent

Claim forming filaments for
incandescent lamps
by volatilizing pure metallic
tungsten in vacuum by
the electric discharge

Also sheets & cutting into filaments

claim Tantalum & other
metals - 7022

Folio No. 321

Serial No. 378,891

Applicant.

Thomas A. Edison

Address.

Llewellyn Park
Orange, N.J.

Title

Telephones.

Filed

June 14, 1907

Examiner's Room No.

109

Assignee

Ass'g't Exec.

Recorded

Liber

Page

Patent No.

Issued

ACTIONS.

1. Rejected July 18, 1907. 16.
2. Rejected July 15, 1908. 17.
3. Rejected Sept 19, 1908. 18.
4. Rejected Sept 14, 1909. 19. Dec 1, 1911 - dropped by
5. Rejected October 29, 1909. 20. instructions of Mr. Edison.
6. Rejected October 27, 1910. 21. H.L.
7. Rejected Dec. 7, 1910. 22.
8. 23.
9. 24.
10. 25.
11. 26.
12. 27.
13. 28.
14. 29.
15. 30.

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, in the County of Essex and State of New
Jersey

prays that letters patent may be granted to him for the improvements in

TELEPHONES

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Orange, New Jersey, his attorney, with full
power of substitution and revocation, to prosecute this application, to make
alterations and amendments therein, to receive the patent, and to transact all
business in the Patent Office connected therewith.

Thomas A. Edison.

- SPECIFICATION -

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, Orange, in the County of Essex and State of New Jersey, have invented certain new and useful improvements in TELEPHONES, of which the following is a description:

My invention relates to improvements in telephones, and my object is to provide a telephone in which sounds of great volume will be obtained at the receiving device. I aim particularly to produce an improved telephone in which batteries and induction coils may be dispensed with, it being possible with my apparatus to obtain a very loud reproduction at the receiver by the use of transmitters of the earliest magneto type, in which the vibration of a diaphragm under the influence of sound waves in proximity to the pole or poles of an electro-magnet will induce currents in the coil or coils thereof corresponding graphically in form to the sound waves.

The invention comprises at each station a very small direct current magneto generator having a revolving armature of small diameter and with numerous coils, and turning at a high speed, the receiver being in circuit with the armature and being actuated by the current generated thereby. Mounted upon one or both of the fields of the magneto at each station, is a coil in the line circuit whereby the undulatory currents on the line will effect corresponding variations in the magnetic fields of the magnetos. By thus operating the armature ~~of the~~ *of the*

of the magneto at each station in a varying field, the variations of which are controlled by the undulatory currents generated or controlled by the transmitting devices, I cause the current generated at each magneto to be correspondingly varied so as to reproduce the sounds in the usual receiving apparatus.. Since, however, the current generated at each magneto will be enormously more powerful than the current which is generated or controlled by the transmitting devices, I obtain a much greater amplification than if the line currents were received by the receiver directly. In other words, with my improved telephone, the line currents instead of directly actuating the receiver, are used to control the magnetic conditions of the generator, the currents of which are many times more powerful than those originally generated or produced. Consequently, such a receiving apparatus might if desired be effectively used as a telephonic relay, receiving from one circuit currents which control the magnetic condition of the generating apparatus and sending out on the succeeding circuit amplified currents generated by the rotating armature. The armatures of the generators may be operated in any suitable way, but I prefer for this purpose to make use of small spring motors, such as are now used for the operation of phonographs, and which can be readily arranged to turn the armature at a speed of 5000 revolutions per minute for from five to fifteen minutes. Such a spring motor can be wound up by hand from time to time, or it may be automatically wound when the receiver is removed from the hook, or by the weight of the operator, as will be understood. While I prefer, for the sake of simplicity of construction, to make use of an ordinary magneto transmitter

at each station, it will be understood that the line currents for varying the field of the generator at each station, may be produced or obtained in other ways, as for example, by the common arrangement of a variable resistance transmitter with battery, either operated alone or in combination with an induction coil.

In order that the invention may be better understood, attention is directed to the accompanying drawings of which -

Figure 1 is a diagrammatic view showing a single receiving station, and illustrating a magneto transmitter;

Figure 2 is an enlarged front elevation of the magneto generator operated by a spring motor, and

Figure 3 is a plan view of the same.

1 represents a very small magneto generator, having fields 2 and armature 3, the latter being preferably about 1/2 inch in diameter and 1/2 inch in length, and having as many coils thereon as possible, in order that the current generated thereby may be as free as possible from fluctuations due to the armature construction. For the same purpose the speed of rotation should be very high, so that any fluctuations in the armature circuit will be rendered practically inaudible at the receiver. With an armature of the size above indicated the commutator may be provided with as many as 24 segments and the armature may be rotated at as high a speed as five thousand revolutions per minute. The brushes 4 and 5 of each generator bear on the commutator 6 in the usual way and connect with the usual telephone receiver 7. Mounted on one or both of the fields 2 of each generator is a coil 8 in the line circuit 9, an all metal circuit being shown for the purpose of illustration.

At each station I illustrate an ordinary magneto transmitter 10 for generating very weak alternating currents corresponding graphically to the sound waves and which actuate the coils 8, so as to vary the magnetic conditions of the fields in which the armatures 3 rotate, whereby the current generated by each generator will likewise correspond graphically to the sound waves, but with an enormous amplification. For driving the armature 3 of each generator, I illustrate a spring motor, the spring being contained in the barrel 11, and the speed being regulated by a centrifugal governor 12, as in ordinary phonograph motors.

Having now described my invention, what I claim as new and desire to secure by letters patent, is as follows:

1. In a telephonic apparatus, the combination with a rotating armature for generating a continuous pulsating current, and a closed circuit therefrom, of ^{means for varying the magnetic field in which the armature rotates} ~~a permanently magnetized field in which the armature rotates~~ means for varying the magnetic field in which the armature rotates in correspondence with sound vibrations, as and for the purposes set forth.

2. In a telephonic apparatus, the combination with a rotating armature for generating a continuous pulsating current and a telephone receiver in circuit therewith, of ^{means for varying the field in which the armature rotates} ~~a permanently magnetized field in which the armature rotates~~ means for varying the field in which the armature rotates in correspondence with sound vibrations, as and for the purposes set forth.

3. In a telephonic apparatus, the combination with a rotating armature for generating a continuous pulsating current and a closed circuit therefrom, of a

7/18/08 *Permanent magnetized coil in which the armature rotates and*
controlling coil for varying the magnetic field in which
the armature rotates, and means for actuating said coil
with a varying current corresponding graphically with
sound waves, as and for the purposes set forth.

4. In a telephonic apparatus, the combination
with a rotating armature for generating a continuous
pulsating current, and a closed circuit therefrom, of a
7/18/08 *Permanent magnetized coil in which the armature rotates and*
coil for varying the magnetic field in which the armature
rotates, a closed circuit including said coil and a magneto
transmitter in said closed circuit, as and for the purposes
set forth.

5. In a telephonic apparatus, the combination
with a rotating armature for generating continuous
pulsating currents, a spring motor for rotating said
armature, and a closed circuit from said armature, of means
7/18/08 *Permanent magnetized coil in which the armature rotates and*
for varying the magnetic field in which the armature ro-
tates in correspondence with sound vibrations, as and for
the purposes set forth.

This specification signed and witnessed this 11th day of June 1907

Thos A Edison

Witnesses:

1. Frank S. Dyke
2. Frank D. Lewis

Oath.

State of New Jersey } ss.,
County of Essex

THOMAS A. EDISON, the abobe named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Orange, in the County of Essex and State of New Jersey

that he verily believes himself to be the original, first and sole inventor of the improvements in

TELEPHONES

described and claimed in the annexed specification; that he does not know and does not believe the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 13th day of June 1907

Thos A Edison

H. H. Dyke

Notary Public.

(Seal)

321

378891

11

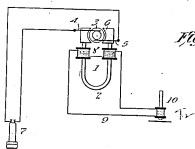
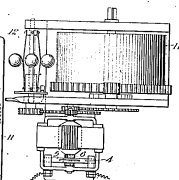
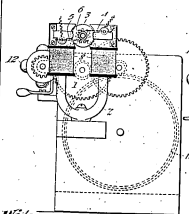


Fig. 1

Fig. 2

Fig. 3



Witnesses:

Frank R. Davis

James P. Nelson

Inventor:

Charles A. Edison

By Edward L. Brown

Atty.

[ON BACK OF PRECEDING PAGE]

Phil. 17

720-8

I have no objection

G. Lubin

16 109
Div..... Room.....
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-900.
HDT

Paper No. 1-

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

July 18th, 1907.

Thomas A. Edison,
Care Frank M. Dyer,
Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application,

for "Telephone" filed June 14, 1907, Ser. No. 378,891.

E. B. Moore

Commissioner of Patents.

This application has been examined.

The claims are rejected on

McDonough, 445,188, Feb. 10, 1891, Class 179-subclass 77.

Regarding claim 4, there would be no invention in employing
any old form of transmitter with McDonough's relay, and as to
claim 5, it would not involve patentability to operate McDonough's
armature by a spring motor.

Examiner, Division XVI.

IN THE UNITED STATES PATENT OFFICE.

Thomas A. Edison)
):
TELEPHONES):
Filed June 14, 1908): Room No. 109
):
Serial No. 378,891):

HONORABLE COMMISSIONER OF PATENTS,

S I R :

Replying to Office rejection of July 18, 1907, please amend the above entitled case as follows:

Page 1 of the specification, please cancel last two words "of the".

Claim 1, line 4, insert - a permanently magnetized field in which the armature rotates and - before "means"; same claim, lines 4 and 5, cancel "in which the armature rotates" after "field".

Claim 2, line 4, insert after "of" - a permanently magnetized field in which the armature rotates and -; lines 4 and 5, after "field" cancel "in which the armature rotates".

Claim 3, line 4, insert before "controlling" - permanently magnetized field in which the armature rotates and -; lines 4 and 5, after "field", cancel - in which the armature rotates -.

Claim 4, line 4, before "coil" insert - permanently magnetized field in which the armature rotates and a -; lines 4 and 5, after "field" cancel - in which the armature rotates -.

Claim 5, line 4, before "means" insert - a permanently magnetized field in which the armature rotates and -; lines 5 and 6, after "field" cancel - in which the armature rotates -.

- R E M A R K S -

Reconsideration is requested.

The claims have been amended in view of the reference of record to distinguish more clearly therefrom.

Applicant employs a small magneto generator having a permanent electro magnet for a field with controlling coils mounted thereon in the line circuit of the telephone transmitter.

The undulatory currents in the line caused by the vibrations of the diaphragm of the transmitter, cause corresponding variations in the magnetic field of the magneto, that is, a greater or less magnetic effect is given the field above that which it normally has, and in consequence the talking current is relayed into the circuit of the receiver.

In the case of the reference Mc Donough, however, it would appear that a pole of soft iron was contemplated for the field. This is thought by applicant to be an inoperative structure. The flow of electric current generated by the battery disclosed through the coils of the field magnet is controlled entirely by the vibrations of the transmitter. Hence the magnetism of the field coils may decrease almost to zero and the current generated by the armature would correspondingly decrease to nothing.

The practical impossibility of getting a talking current through the field coils and the battery disclosed by the Mc Donough patent should also be noted.

In view of these amendments and remarks, a reconsideration and allowance of this case are respectfully requested.

Thomas A. Edison

By Frank R. Oyer

His Attorney

Orange, New Jersey

July 17th 1903.

321

3-260.

Div. XVI. Room 109.
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

G.E.N.

Paper No. 3.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

Thomas A. Edison,

WASHINGTON, D. C.

September 19, 1908.

C/o Frank L. Dyer,

Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application,
#378,891, filed June 14, 1907, for Telephones.

E. B. Moore

Commissioner of Patents.

This action is in response to amendment of July 16,
1908.

Each of claims 1, 2, 3, 4 and 5 is again rejected
on McDonough, of record. In line 30, page 1, of McDonough's
specification, the generator is described as a magneto electric
machine, which implies that permanent magnets were in contempla-
tion. Again, in lines 50-55, the magnets are described as being
permanent magnets.

page 2

hewson

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)

TELEPHONES)

Filed June 14, 1907)

Serial No. 378,891)

Room No. 109

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of September 19, 1908, please amend the above entitled case as follows:

Cancel all the claims and substitute the

following:

Cancelled 11/17/10
1. In a telephonic apparatus, the combination with a rotating armature having a large number of coils for generating a continuous pulsating current free from fluctuations, means for rotating the same at high speed, and a closed circuit therefrom, of a permanently magnetized field in which the armature rotates, and means for varying the field in correspondence with sound vibrations, substantially as set forth.

11/17/10
2. In a telephonic apparatus, the combination with a rotating armature having a large number of coils for generating a continuous pulsating current free from fluctuations, means for rotating the same at high speed, *rotatable* and a closed circuit therefrom, of a permanently magnetized

field in which the armature rotates, a controlling coil for varying the magnetization of said field, a closed circuit including said coil, and means for impressing a current corresponding to sound vibrations on said circuit, substantially as set forth.

R E M A R K S

The claims as amended are thought to distinguish patentably over the reference, and reconsideration and allowance are respectfully requested. It is thought that the construction as shown and described by McDonough would not be operative or efficient for the purpose desired. Applicant places a controlling coil on one or both of the fields of a permanent magnet, provides the armature with as great a number of coils as possible to generate a current practically free from fluctuations, and rotates the same at as high speed as possible so that whatever fluctuations there may be will be inaudible at the telephone receiver.

Respectfully submitted

THOMAS A. EDISON

By

Frank L. Oger

His Attorney

Orange, New Jersey

September 14, 1909.

321

Div. XVI Room 109

ADDRESSES ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

2-200.

Paper No. 5

F.H.

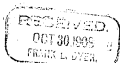
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C., October 29, 1909.

Thomas A. Edison,

c/o Frank L. Dyer,
Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application,
S. No. 378,891, filed June 14, 1907, Telephones.

E. B. Moore

Commissioner of Patents.

This action is in response to amendment filed Sept.
15, 1909.

The claims now presented are again rejected on
McDonough, of record. The reference describes the use of
a dynamo electric or a magneto electric machine of any
desired kind. See page 1, lines 56 and 57 of the speci-
fication. A magneto electric machine is a machine having
a field produced by a permanent magnet, and therefore it
is not seen that the claims presented contain anything of
a patentable nature over the reference.

*copy filed
for suit*

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison :
TELEPHONES : Room No. 109
Filed June 14, 1907 :
Serial No. 378,891 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of October
29, 1909, please amend this case as follows:-

Cancel Claim 1.

Renumber Claim 2 as 1, and in line 5 thereof
insert - metallic - before "circuit".

R E M A R K S

Reconsideration and allowance are requested.
The claim is thought to distinguish specifically from the
reference. The reference is quite vague as to its dis-
closure and it is thought that the same should not be
given sufficient weight to prevent the grant to a patent
to applicant for reasons already set forth.

Respectfully submitted,

THOMAS A. EDISON

By Frank L. Dyer

Orange, New Jersey

His Attorney

October 27th, 1910.

Div. ... Room ... 109

Address only
The Commissioner of Patents,
Washington, D. C.

2-280

P.H.

Paper No. 7

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

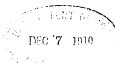
WASHINGTON

December 7, 1910.

321
Thomas A. Edison,

C/o Frank L. Dyer,

Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

S. No. 378,891, filed June 14, 1907, Telephones.

E. B. Moore

Commissioner of Patents.

This action is in response to amendment filed Oct. 29,
1910.

The claim is not seen to patentably distinguish from
McDonough, of record, and is, therefore, finally rejected.
This reference seems to completely anticipate applicant's
altered invention.

F 321. V

Dec 1, 1911

Showed file and reference to
Mr. Edison and asked for
suggestions as to patentability.

Mr. Edison said the invention
was no good, and instructed
me to drop the case.

HL

446.188

221

Note Mr Edison says this is suspension because it is necessary to have electromagnet

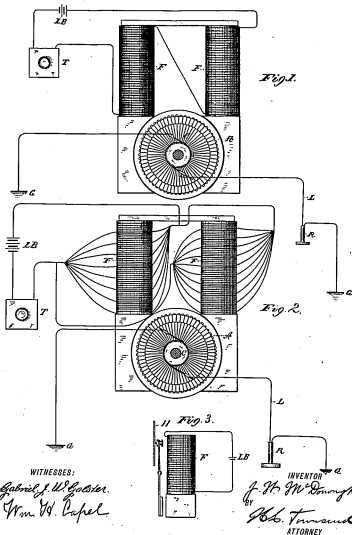
(No Model.)

2 Sheets—Sheet 1.

J. W. McDONOUGH.
TELEPHONE TRANSMISSION.

No. 446,188.

Patented Feb. 10, 1891.



WITNESSES:

Gabriel J. W. L. L. L.
Wm. H. L. L.

INVENTOR

J. W. McDonough
Attorney

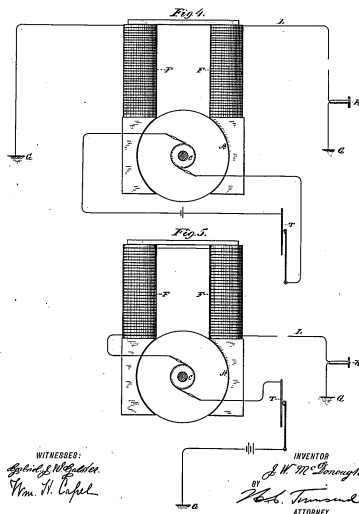
(No Model.)

J. W. McDONOUGH,
TELEPHONE TRANSMISSION.

No. 446,188.

2 Sheets—Sheet 2.

Patented Feb. 10, 1891.



UNITED STATES PATENT OFFICE.

JAMES W. McDONOUGH, OF NEW YORK, N. Y.

TELEPHONE TRANSMISSION.

SPECIFICATION forming part of Letters Patent No. 446,188, dated February 10, 1891.

Application filed August 28, 1885. Serial No. 175,544. (No model.)

To all whom it may concern:

Be it known that JAMES W. McDONOUGH, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful improvements in Telephone Transmission, of which the following is a specification.

My invention relates to means for transmitting spoken words and musical tones, by the agency of electricity, and is designed as an improvement upon the mechanical present in use involving the employment of so-called "induction coils."

The object of my invention is to increase the volume of sound as transmitted, and to provide, and to this end my invention consists in the combination, with a transmitter responsive to sound-vibrations of any kind, of a dynamo-electric or magneto-electric machine whose field is magnetized by an electric current, and through the action of said transmitter, while its armature, operated by any suitable power, delivers a current that is utilized directly or indirectly in operating upon a suitable receiver.

My invention consists, secondly, in a novel method of transmitting sounds electrically by automatically changing the magnetic condition of a dynamo or magneto-electric machine in accordance with the sound-vibrations, while at the same time driving the machine by any suitable power, and in employing the changed electric currents thus developed in the machine to operate directly or indirectly upon the receiver.

My invention consists, thirdly, in an improved method of transmitting sounds by electricity, consisting in automatically varying the intensity of a magnetic field through the agency of an instrument responsive to sounds, and in operating the receiving instrument by means of the current delivered from a magneto-electric armature that is placed in such variable field and is operated by any suitable mechanical power.

In the accompanying drawings I have illustrated preferred forms of apparatus for carrying out my invention.

Figure 1 shows a simple arrangement; Fig. 2, a modified arrangement of the exciting coils by which the magnetic field is produced.

Figs. 3, 4, and 5 illustrate other ways of carrying out the invention.

Referring to Fig. 1, F indicates the field-magnets of a dynamo-electric or magneto-electric machine of any desired kind, and A an armature for said machine. I prefer to employ as an armature the well-known Pacinotti or Gramme armature or any other form having quite a large number of coils and adapted to deliver a current of great uniformity.

C indicates the commutator of such armature, and I, the conductor leading to the telephone-receiver R at any desired point. The brushes of the commutator are connected to the circuit, so that the armature will deliver a current to the telephone-receiver connected with the telephone-receiver. The field-magnet coils F are connected in series with one another in or to a circuit containing a battery B or other generator of electricity, the flow of which through the coil of the field-magnet is controlled in any desired manner by the agency of an instrument responsive to sound-vibrations.

T indicates such an instrument, consisting of an ordinary telephone-transmitter, which, for the purpose of controlling the flow of current in the circuit to the coils, is placed, as shown, in the direct circuit, including said coils and source of electricity. I do not, however, limit myself to such special arrangement, but design employing any arrangement of connections or of devices whereby, through the agency of an instrument responsive to sound-vibrations, the magnetic intensity of the field in which the armature A revolves may be varied, or vice versa. The armature A is to be driven by any suitable mechanical power and to be kept at as nearly a uniform rate of revolution as is practicable.

The operation of the apparatus described would be as follows: The armature A, being revolved, delivers a current to the circuit I, and receiver R, which current being practically continuous produces no sensible or real sounds in the receiver R. If, however, the magnetic field in which the armature revolves be varied, the current delivered by the armature will, as is well known, be correspondingly varied in accordance with the changes of magnetic intensity in the field. If such

changes do made to take place in accordance with sound-vibrations, pulsations or changes of current in the circuit I, and receiver R will obviously correspond to such sound-vibrations and the receiver R will reproduce them. The changes resulting in such action are produced in obvious manner by the action of the transmitter T, which, as it vibrates under the action of sound, produces electrical changes in the current exciting the field magnets for armature A, and if words be spoken to the transmitter T, so as to set the same in suitable vibration the words spoken will be produced in the receiver R.

In order that the changes produced by the action of the transmitter may cause as great a change as possible upon the intensity of the field magnetism, it is desirable in case said transmitter operates with variations of resistance to have the coils of the field-magnet oppose little resistance in the circuit. It may therefore be found desirable in some instances to divide the field-coils into sections, as illustrated in Fig. 2, and to connect them in multiple arc, as indicated. The changes in connection obviously would not change the principle or method of operation.

I have shown one way in which the magnetic field may be varied by the action of the sound-vibrations so as to cause corresponding vibrations in the induced armature-current. I do not, however, limit myself to such special means, and might obviously employ other devices for causing the magnetic changes of intensity. One of the ways by which such changes may be produced is by moving an armature with relation to the poles of the field-magnet, so as to vary the sensible magnetic action of the magnet. I have in Fig. 3 indicated a way in which such method might be practiced. D indicates such armature applied to the poles of the field-magnet of the form shown in the preceding figures, and H a diaphragm responsive to sound-vibrations and operating upon the lever carrying the armature, so as to vibrate the armature to and from the poles of the magnet and to produce the changes in the intensity of the magnetic field in which the armature revolves. The field may be maintained by the action of a local battery, whose current circulates in the coils of the field-magnet without practical variations; or the magnet might be simply a permanent magnet. The same variations

may be obtained by placing the transmitter of Fig. 1 in the circuit of the armature and the receiver in that of the field-magnets, as indicated in Fig. 4. The armature and field coils may also be connected in one continuous circuit with the receiver and transmitter, as indicated in Fig. 5. In both these instances the changes of magnetic condition produced in the machine by the action of the transmitter while the machine is being run by any suitable power will result in developing correspondingly-changing currents by the action of the driving-power, and the strong currents thus produced are singly or in conjunction with the original circuits made to operate the receiver.

What I claim as my invention is—

1. The herein-described method of transmitting sounds electrically, consisting in producing changes in the intensity of a magnetic field corresponding to the character of the sound-vibrations, revolving a magneto-electric armature in said field by any suitable power, and delivering the variable currents as produced to a suitable receiving-instrument.

2. The herein-described method of transmitting sound electrically, consisting in producing changes in the intensity of an electric armature revolving in a magnetic field by any suitable power in correspondence with the changes in the intensity of the vibrations of the sound to be transmitted, and delivering the variable currents thus produced to a suitable receiving-instrument.

3. The herein-described method of transmitting sound electrically, consisting in automatically changing the magnetic condition of a dynamo or magneto electric machine in accordance with the changes of intensity of the sound waves or vibrations to be transmitted, while at the same time driving the machine by any suitable external power, and delivering the electric vibrations thus produced in a circuit of the machine directly or indirectly to a suitable receiver.

Signed at Geneva Lake, in the county of Walworth and State of Wisconsin, this 10th day of August, A. D. 1883.

JAMES W. McDONOUGH.

Witnesses:

FRANK L. EASTMAN,
C. E. BUELL.

Folio No. 322

Serial No. 378,890

Applicant.

Address.

Thomas Alva Edison. *Llewellyn Park*
Orange, N.J.

Title *Discharging Apparatus for Belt Conveyors*

Filed *June 1st 1907*

Examiner's Room No

Assignee

Ass'g't Exec.

Recorded

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Page

Patent No. 861,819

Issued

July 30 1907

ACTIONS.

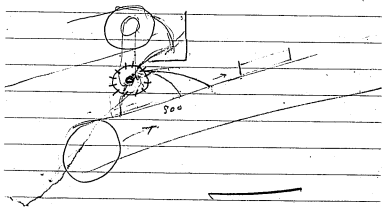
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2. *Trans. for div. Jan. 1908* 17
3. *Trans. for div. July 10 1907* 18
4. 19
5. 20
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7. 22
8. 23
9. 24
10. 25
11. *Vault* 26
12. 27
13. 28
14. 29
15. 30

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

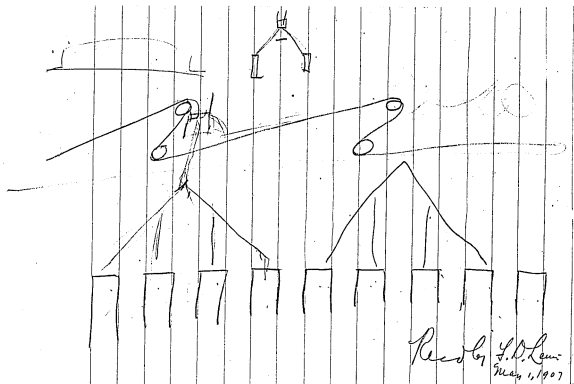
Patent



Agua Cement

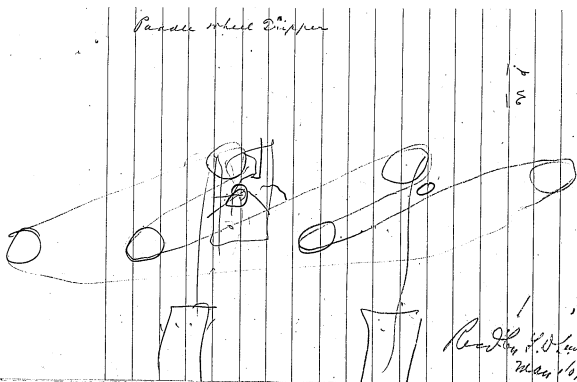
Rec'd by F.D.H.

May, 1907



Reed, J. D. Lewis
May 1, 1907

Paddle wheel tripper



Reed, J. D. Lewis
May 1, 1907

Folio No. 324

Serial No. 380,908

Applicant.

Address.

Thomas Alva Edison Llewellyn Park
Orange N.J.

Title

Sprocket-Chain Drive

Filed

June 26, 1907

Examiner's Room No.

324

Assignee

Edison Portland Cement Co.

Assigned by T. A. E. to T. A. E. Inc.

Ass't Exec. June 30, 1916 Recorded July 7, 1916 Liber 7127 Page 50

Patent No.

954,789

Issued

Apr. 12, 1910.

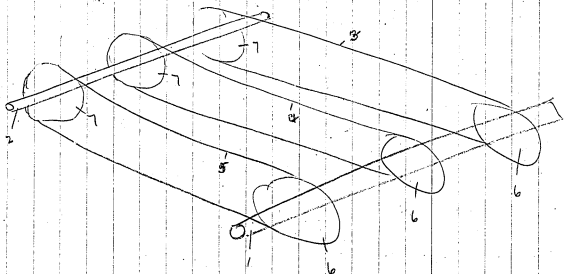
ACTIONS.

1. Rejected Aug. 1, 1907. 16
2. Amended July 29, 1908. 17
3. Office letter Aug. 15, 1908. 18
4. Amended Aug. 3, 1909. 19
5. Office letter Aug. 26, 1909. 20
6. Amended Sept. 4, 1909. 21
7. Allowed Oct. 9, 1909. 22
8. Final fee due Apr. 9, 1910. 23
9. " " paid Mar. 16, 1910. 24
10. 25
11. 26
12. 27
13. 28
14. 29
15. 30

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.



Rec'd on 4/10/1
May 1, 1917

[ON BACK OF PRECEDING PAGE]

Edison Sketches
Reedy, W.K.
May 1899

Folio No. **325**Serial No. **379,830**

Applicant.

Address.

*Thomas Alva Edison**Llewellyn Park
Orange N.J.*

Title

Telegraphy

Filed

*June 20, 1907*Examiner's Room No. *109*

Assignee

Ass'g't Exec.

Recorded

Liber

Page

Patent No. *909,877*

Issued

Jan 19, 1909

ACTIONS.

1	<i>Rejection July 22, 1908</i>	16
2	<i>Amended Mar. 28, 1908</i>	17
3	<i>Rejection Mar. 9, 1908</i>	18
4	<i>Amended October 28, 1908</i>	19
5	<i>Allowed Dec. 11, 1908</i>	20
6	<i>Final fee due June 11, 1909</i>	21
7	<i>Final fee paid Dec 18, 1908</i>	22
8		23
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10		25
11		26
12		27
13		28
14		29
15		30

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Dyer if you can't
see it working
Come up

See me about aluminum
Rectifiers for Big Phases

Object of invention -

Is to transmit alternating currents over

Recd-
Jan 7/07
gk

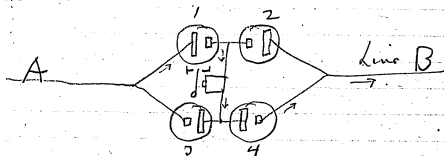
Telegraph Circuits ~~are~~ in which
currents are included both polarized
relays & unpolarized relays, without the
unpolarized relay losing its magnetism
temporarily at the moment of reversal
which obtains at present on an ad duplex
telegraph apparatus & is very objectionable

The invention consists in forming a bridge
in each leg of which there are
Aluminum Rectifiers the two top

2

Relays having their Aluminum poles connected and the two bottom having their Lead or platinum electrodes connected.

The unpolarized Relay being placed in the bridge wire and the bridge inserted in the circuit in the usual manner —



When the current passes in the direction from A to B, then the current proceeds through No. 1 down the bridge wire thru the relay + thence thru cell 4 to Line B — it cannot pass thru 3 + 2 because the aluminum film

3

offers a resistance which is practically insulating.
If now the Current ~~passes~~ is reversed
it passes from B to Cell 2. Thence
thru bridge coils in the same direction
as the Current from A - thence thru 3 to A,
the Current not passing thru Either 4 or 1
for the reason mentioned, hence in
reversal there is no change of its
direction thru the Relay & the
objectionable momentary opening or
jerk is done away with -

It is obvious that this device can be
used with the principle of
transmission of two messages in
the same or the opposite direction
when one message is transmitted by

4

increasing & diminishing the strength
of the Current & the other
messages is transmitted by reversing
the direction of the Current, also

~~It is also useful~~

~~where~~ where these systems are
Duplexed & made Quadruplex

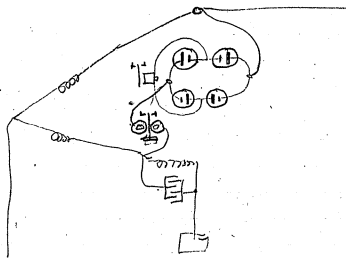
Claim In Duplex & Quadruplex
systems of Cady (Where messages
are sent by increasing & diminishing a
Current & other message by reversing
the direction of the same) of a
Aluminum Rectifier Substation
for preventing loss of magnetism on
the unbalanced relay at the
moment of reversal

5

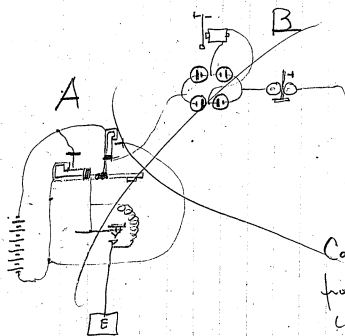
Claim it in the end -

Jan 3rd 1907
Taz

Recd from 7/07
520



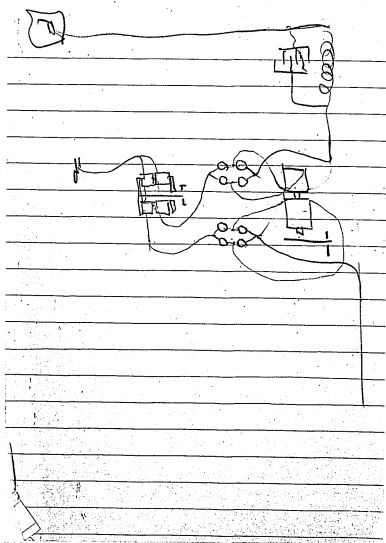
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J.K.D.



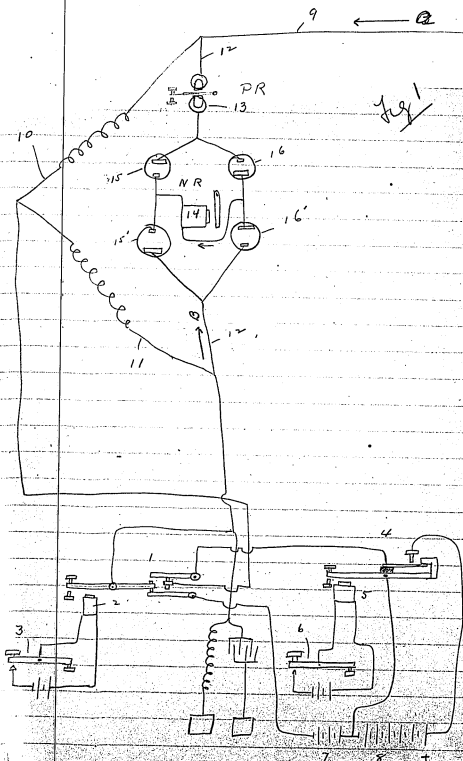
B Here

Can give you proper diagram
from Prescott's book
when you are Ready

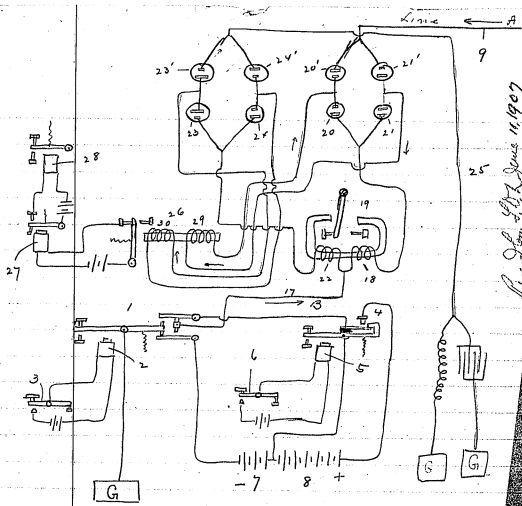
Recd from 7/07
F.L.D.



Bridge Method



Ready to be done June 11, 1907



Received 2/12/2 Jones 11/1907

Differential Method

Fig 2

10-11-1907

-SPECIFICATION-

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS ALVA EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, County of Essex and State of New Jersey, have invented certain new and useful IMPROVEMENTS IN TELEGRAPHY, of which the following is a description:-

My invention relates to improvements in telegraphy and my object is to provide an arrangement by which a neutral relay designed to be operated by variations in current strength, will be unaffected by reversals of current in the circuit in which the relay is included. Such a situation is presented in connection with the well-known quadruplex telegraph operating either on the bridge or differential principle. With such an apparatus at the receiving station and in circuit with the line and with *reference to reversals of current, and a neutral relay* each other are arranged a polarized relay responsive to variations in current strength. One of the defects which has always existed in the quadruplex telegraph, or in fact, in any other system in which a neutral relay is traversed by a reversed current, is that when the armature of the neutral relay is attracted by the full current strength and a reversal of the current takes place, the armature momentarily falls away from the front stop with the likelihood of producing a "kick" or false signal in the local sounder. Numerous suggestions have been proposed for overcoming this defect, such as arranging the neutral relay to

make contact on the back stop, or by arranging an auxiliary magnet which co-operates with the armature of the neutral relay and receives a momentary charge from a condenser when the current by the change of polarity ceases, to thereby serve to bridge over the interval of no magnetism. The suggestions which have been made for overcoming the defect mentioned have not, however, in practice and on lines of considerable length, been entirely satisfactory, since in reversing the current through the neutral relay the magnets thereof when the current ceases, require to be completely discharged before they can be built up by the succeeding impulse of opposite polarity, and during this interval the relay armature being no longer attracted is free to be drawn back to produce a false signal. By my invention, I entirely overcome this defect, since I arrange the neutral relay in such a way that although the current on the line may be reversed, the current passing through the neutral relay will be always of the same polarity. Although the current which thus traverses the neutral relay will be momentarily weakened during the changes of polarity on the line, yet, since the polarity of the magnets of the neutral relay is never changed, there is no interval corresponding to that now encountered when the polarity of such magnets is changed, and furthermore, the residual magnetism will materially aid in maintaining the attraction of the armature during the periods in which the current is momentarily weakened. I find from actual experiments with the apparatus that there appears to be substantially no movement of the

armature of the neutral relay under the conditions noted, when the current through the same is reversed, while under the ~~same~~ ^{old} conditions, when the reversals take place in the relay magnets, the movements of the armature thereof away from the front stop are quite perceptible. In carrying the invention into effect I combine with the neutral relay a suitable arrangement of rectifiers by which, although the current on the line may be reversed, the polarity of the current influencing the neutral relay will remain unchanged, as I will more fully hereinafter describe and claim. The most satisfactory rectifier for the purpose, both as to economy of installation and certainly of operation, is the so-called aluminum rectifier, employing an aluminum electrode opposed to an electrode of lead ~~or~~ platinum in a suitable electrolyte. Such a rectifier, as is well known, when included in an electric circuit, presents a practically perfect insulation to currents of one polarity without appreciably resisting currents of the opposite polarity. It becomes possible, as I hereinafter point out, to arrange a number of these rectifiers in such a way that currents of reversed polarity will be so commutated as to pass through the neutral relay always in the same direction.

In order that the invention may be better understood attention is directed to the accompanying drawings, in which -

Figure 1, is a diagram of the well-known form of quadruplex apparatus at one end of the line, operating on the principle of the Wheatstone bridge, and in which I show

an arrangement by which the neutral relay thereof although in circuit with the polarized relay will not be subjected to the reversals of current which control the polarized relay, and

Figure 2, a similar view of a corresponding apparatus operating on the differential method in which rectifiers are employed for ^{commutating} ~~actuating~~ the reversals of current at the neutral relay.

Referring first to Figure 1, most of the elements are so well-known as to require no more than a very general description. A pole changer 1, is controlled by a magnet 2 from a key 3, in a local circuit. The transmitter 4, is controlled by a magnet 5, operated by a key 6, in a second local circuit. The battery 7, 8, ^{is} divided into unequal portions. By reason of the connections shown, the pole changer 1 sends to the line 9, reversals of current from the battery 7, or the two batteries 7, 8 in combination, while the transmitter 4 cuts the battery 8 in or out of line, as may be desired. One of the bridge wires 10 leads to the line, and the other bridge wire ^{is} to ground, as shown. The circuit 12, which completes the bridge, includes the polarized relay 13, of any usual construction, which controls the ordinary sounder in the usual way, and said circuit also includes a neutral relay 14 of any suitable character, whose armature through a suitable auxiliary relay, controls a second sounder. In the circuit 12, is also included, four rectifiers 15, 15' and 16, 16', arranged as shown, the aluminum electrodes thereof being represented as

considerably longer than the lead or platinum electrodes. It will be observed that the circuit after passing the polarized relay 13 branches and leads to the aluminum electrode of the rectifier 15 and to the lead or platinum electrode of the rectifier 16. It will also be observed that the aluminum electrode of the rectifier 15' and the lead or platinum electrode of the rectifier 16' are connected with the circuit 12 beyond the neutral relay, while the connections to the neutral relay are between the rectifiers of the two sets. By reason of this construction, it will be seen that if the current flows along the line 9 towards the polarized relay 13, as indicated by the arrow A, it will encounter the aluminum electrode of the rectifier 15, which will act practically as an insulator, so that all the current will pass through the rectifier 16. This current will then encounter the aluminum electrode of the rectifier 16', which will oppose it, so that all the current passes in the direction of the arrow through the neutral relay and thence through the rectifier 15' to the line 12. If, however, current passes in the opposite direction, as shown by the arrow B, it will encounter the aluminum electrode of the rectifier 15' and consequently, will pass through the rectifier 16' and thence through the polarized relay in the same direction as before, thence through the rectifier 15 and polarized relay to the line. Thus, it will be seen that although the current is reversed on the line so as to actuate the polarized relay, yet: no reversal of current takes place at the neutral relay. Although during the change of polarity, the current in the neutral relay will manifestly be weakened, this effect is momentarily much shorter

than the interval required to discharge and build up the magnetism in the neutral relay if the current ~~was~~^{now} reverse ~~d~~ through the same. Furthermore, as I have before pointed out, the residual magnetism of the neutral relay tends materially to hold its armature in a attracted position during the momentary periods in which the weakening of the current takes place.

Referring now to Figure 2, I here illustrate a quadruplex apparatus operating on the differential principle, most of the parts being so well known as to require only a very general description. Here there is a pole changer 1, operated by a magnet 2, controlled by a key 3, in a local circuit, and a transmitter 4, operated by a magnet 5, controlled by a key 6 in a second local circuit, and a battery 7, 8, as with the arrangement shown in Figure 1. From the neutral connection of the pole changer 1, a circuit 17 extends to one of the differential coils 18, of the differential polarized relay 19. Thence, the circuit extends through four rectifiers 20, 20', and 21, 21', as shown, and thence to the line 9. The circuit 17 also includes the differential coil 22 of the relay 19, and thence extends through four rectifiers 23, 23' and 24, 24', arranged as shown, and thence to the artificial line 25. The differential neutral relay 26 is arranged so that its armature on the back stop will control an auxiliary relay 27, which in turn controls a sounder 28 in the usual way. The main line coil 29 of the differential relay is as shown, connected between the rectifiers 20, 20' and rectifiers 21, 21', while the artificial line coil 30 is connected between the

rectifiers 23,23' and 24,24'. With this arrangement, as with Figure 1, the aluminum electrodes of the rectifiers are illustrated as considerably longer than the lead or platinum electrodes thereof. In operation, assuming the current from the distant station to be flowing on the line 9, in the direction of the arrow A, it will be opposed by the aluminum electrode of the rectifier 20' and will therefore enter the rectifier 21', and being opposed by the aluminum electrode of the rectifier 21, will flow through the main line coil 29 of the neutral relay in ^{the} direction of the arrows, passing thence through the rectifier 20 and the main line coil 18 of the polarized relay. Assuming that this current is of the full battery strength, the neutral relay will therefore be operated, while, if of the proper polarity to operate the polarized relay, the armature of the latter would be attracted. If, however, the current from the distant station is reversed and flows in the direction of the arrow B, it will be opposed by the aluminum electrode of the rectifier 20, and hence will enter the rectifier 21, so as to traverse the main line coil 29 of the neutral relay in the same direction as before, and will pass to the line 9 through the rectifier 20'. Hence, the reversals of the current on the main line will not affect the main line coil 29 of the neutral relay, which, therefore, will never be reversed as to its polarity. A current from the home station flowing in the direction of the arrow B, will flow equally through the line coil 18 and the artificial ^{main} coil 22 of the polarized relay, so that said coils will oppose one another, in the usual way. The

current from the main line coil 18 in passing to the main line 9, will take the same direction as before in passing through the main line coil 29 of the neutral relay. That part of the current which traverses the artificial line coil 22 of the polarized relay will enter the rectifier 23 and proceed thence to the artificial line coil 30 of the neutral relay, thereby opposing the coil 29 so as not to affect the neutral relay, and thence through the rectifier 24' to the artificial line 25. ^{Although} When the current at the home station is reversed, ^{and} by reason of the rectifiers arranged as shown, no reversal takes place at the neutral relay, and consequently, the objection now encountered of the armature being withdrawn when the current is reversed on the main line, will be overcome. It will be understood, of course, that the arrangements I have above described are merely illustrative of my invention, and that suitable modifications thereof will be made in applying the invention in other connections and in other arts.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is as follows:-

1. The combination with a circuit, and means for impressing thereon currents of varying strength, and of reversed polarity, of a neutral relay and a series of rectifiers between the said relay, and said circuit, and so disposed as to commutate said currents, whereby they will always influence the relay in the same direction, substantially as and for the purposes set forth.

2. The combination with a circuit, and means for impressing thereon currents of varying strength and of reversed polarity, of a neutral relay and a series of aluminum rectifiers between the said relay and said circuit/ and so disposed as to commutate said currents, whereby they will always influence the relay in the same direction, substantially as and for the purposes set forth.

3. The combination with a neutral relay arranged to make contact on its back stop, of a series of rectifiers in circuit therewith/ and so arranged as to commutate currents of reversed polarity, whereby such currents will influence the relay always in the same direction, substantially as set forth.

4. The combination with a neutral relay, arranged to make contact on its back stop, of a series of aluminum rectifiers in circuit therewith/ and so arranged as to commutate currents of reversed polarity, whereby such currents will influence the relay always in the same direction, substantially as set forth.

5. The combination with four rectifiers/ arranged in pairs with the rectifiers of each pair oppositely disposed, of a neutral relay connected between the rectifiers of each pair, as and for the purposes set forth.

6. The combination with four aluminum rectifiers, arranged in pairs with the rectifiers of each pair oppositely disposed, of a neutral relay connected between the rectifiers of each pair, as and for the purposes set forth.

7. In a telegraph apparatus, the combination with the main line, a polarized relay, a neutral relay, and means for impressing upon the main line currents of varying strengths and of reversed polarity, of means for commutating the currents at the neutral relay, whereby the currents will always influence said relay in the same direction, substantially as and for the purposes set forth.

8. In a telegraph apparatus, the combination with the main line, a polarized relay, a neutral relay and means for impressing upon the main line currents of varying strengths and of reversed polarity, of a series of rectifiers co-operating with the neutral relay and so arranged that any currents influencing the same will always flow in the same direction ^{through the neutral relay} irrespective of their direction on the main line, substantially as and for the purposes set forth.

9. In a quadruplex telegraph system, the combination with the main line, a bridge and means for impressing upon the main line currents of varying strength and reversed polarity, of a polarized relay connected across the bridge, four rectifiers in said connection arranged in two sets, and a neutral relay having connections between each set of rectifiers, substantially as and for the purposes set forth.

10. In a quadruplex telegraph system, the combination with the main line, a bridge and means for impressing upon the main line currents of varying strength and reversed polarity, of a polarized relay connected across the bridge, four aluminum rectifiers in said connection arranged in two sets, and a neutral relay having connections between

each set of rectifiers, substantially as and for the purposes set forth.

Folio No. **351**Serial No. **403, 403**

Applicant.

Thomas A Edison

Address.

Llewellyn Park

Title.

Filaments for Incandescent Lamps

Filed

November 20, 1907

Examiner's Room No

107

Assignee

Ass'g't Exec.

Recorded

Liber

Page

Patent No. *Abandoned*

Issued

Dec. 28, 1915

ACTIONS.

- | | | |
|----------------------------------|----|--|
| 1 <i>Rejected May 7, 1908</i> | 16 | <i>When the said</i> |
| 2 <i>Amended May 6, 1909</i> | 17 | <i>the said</i> |
| 3 <i>Amended May 28, 1909</i> | 18 | <i>the said</i> |
| 4 <i>Amended May 26, 1910</i> | 19 | <i>the said</i> |
| 5 <i>Rejected June 28, 1910</i> | 20 | |
| 6 <i>Amended June 20, 1911</i> | 21 | <i>Mr. Edison says to offer</i> |
| 7 <i>Rejected Aug. 10, 1911</i> | 22 | <i>this case to General Electric</i> |
| 8 <i>Amended July 19, 1912</i> | 23 | <i>Co., or if they do not want it,</i> |
| 9 <i>Rejected Oct 4, 1912</i> | 24 | <i>to let it drop.</i> |
| 10 <i>Amended Sep. 25, 1913</i> | 25 | <i>Nov. 15, 1915 HC</i> |
| 11 <i>Rejected Jan. 6, 1914</i> | 26 | |
| 12 <i>Amended Dec. 19, 1914</i> | 27 | |
| 13 <i>Rejected Dec. 26, 1914</i> | 28 | |
| 14 | 29 | |
| 15 | 30 | |

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

*Finally***VAULT**

Filed

Application

Received
Nov 14, 1907
James L. Ryan

The object of this invention is to make a filament of Carbon which shall have ~~the~~ a stability equal to those now in use in incandescent lamps and a very much higher economy.

The invention consists in using naturally Crystallized flake graphite that kind which resists powerful Chemical Oxidizers the most purifying this graphite by immersion in Molten Caustic Soda above a red heat ^{to remove impurities} afterwards dissolving out the Soda & treating the graphite with Concentrated Hydrochloric acid to

2 filament

remove iron & other ingredients not removed by the Soda - Washing the graphite free of these products - ~~then~~

The invention further consists in grinding such flake graphite in a machine such as a Chilian Mill with Moistened with Rosin dissolved in alcohol or Molasses glucose - all of which are used at their most sticky point. This serves to tear the leaves of the graphite apart. Each ~~of~~ Natural flake being composed of 50 or more leaves - Then after the leaves are separated a form

up to the right degree of fineness. The Rosen or Malassis is dissolved out, by boiling water —

The product which is ~~off~~ ^{deflected} of extreme tenacity is floated in alcohol. The lightest & smallest particles which float are filtered off — until only a portion is left which is ~~off~~ particles too large to use —

After drying the graphite is mixed with a binder & squarled into filaments by use of a press & die. The filaments are then baked in charcoal to a red heat & mounted in the

Incandescent lamp

The binder which I now use is a jelly of acetate of alumina. The acetic acid goes off in the baking as the alumina oxide remains with the filament & probably ~~forms~~ ^{enters into} some

Chemical reaction with the filament when it is brought up to a high temperature on the ^{air} exhausting pump. Other binders will be the subject of subsequent applications. Drawing —

Natural graphite ~~is~~ is the most refractory kind of carbon far exceeding that deposited on filaments from hydrocarbons, and it can be worked at a far higher temperature thus giving great economy

Claim -

A filament for incandescent lamps consisting of an aggregate of very small single leaflets of natural flake graphite.

2nd The graphite as made ~~is~~

3rd The kind of graphite mixed with a binder & granulated into fine filaments through a die

4th & baked & then brought up

on the vacuum pump to

cause the binder to perform

the final chemical reaction.

76?

Material crust from graphite

1 - Purify, immerse in NaOH or KOH , heated, to remove silicates (L)

2 - Dissolve out the NaOH by washing

3 - Treat graphite with boiling HCl (to remove Fe)

4 - Again wash

5 - Grind in mill with moderately ^{o.d.} dry, dim in alcohol, etc.

6 - Dissolve out the binder (stickers)

(Graph. thus obt. in small lumps)

7 - Float gr. to select lightest

8 - Mix with binder

9 - Pressed & formed

10 - Baked, or filaments heated by current, to decompose binder (acetate of al)

Pitchford

Foliated flat graphite

1 - Purify

2 - Ground in mortar or bag

3 - Mixed with KClO_3 and H_2SO_4 Explosive.

4 - Pour little flux of sodium mass (to remove silicates)

5 - Heat purified product, getting swollen (graph. acid) H_2SO_4

6 - Mix gas carbon, graphite, & cannel + ground.

7 - Pressed & formed.

8 - Dried and Baked

Fox

conducting melt as plumbago
as MgO , CaO , etc.

[FROM HENRY LANAHAN]

November 15, 1915

Mr. Moadoveroff:-

Re application of Thomas A. Edison for Filaments for Incandescent Lamps, filed Nov. 20, 1907, Serial No. 403,043

Mr. Edison has instructed me to offer the above application to the General Electric Company on condition that they shall assume all further expenses in its prosecution and pay the final fee. The application contains the following claims:-

1. A filament for incandescent lamps, containing an aggregate of small leaflets of natural crystallized flake graphite, substantially as described.
2. A filament for incandescent lamps, comprising an aggregate of suitable binding material and small leaflets of natural crystallized flake graphite, substantially as described.
3. A filament for incandescent lamps, comprising aluminum oxid and small particles of natural flake graphite, substantially as described.
4. A filament for incandescent lamps, comprising an aggregate of aluminum oxid and small leaflets of natural flake graphite, substantially as described.
5. The process of making filaments for incandescent lamps, which consists in mixing a binder of aluminum acetate with a mass of cleaned natural flake graphite in the form of extremely small leaflets, forming this mixture into filaments and baking the filaments so formed, and thereby driving off acetic acid from the acetate of aluminum, substantially as described.
6. The process of making filaments for incandescent lamps, which consists in grinding cleaned natural crystallized graphite in the presence of a sticky material so as to separate the individual leaves or laminae, washing out the sticky material, mixing the finely divided graphite with a binder, forming the mixture into filaments and finally baking the filaments, substantially as described.

7. The process of making filaments for incandescent lamps, which consists in mixing a binder with a mass of cleaned natural crystallized flake graphite in the form of extremely small leaflets, forming this mixture into filaments and baking the filaments so formed, substantially as described.

8. The process of making filaments for incandescent lamps, which consists in grinding cleaned, natural, crystallized graphite in the presence of a sticky material so as to separate the flakes of graphite into their individual leaves or laminae, washing out the sticky material, separating out the finer and lighter particles of flake graphite, mixing the finer and lighter particles separated out with a binder, forming the mixture into filaments, and finally baking the filaments, substantially as described.

Claims 3 and 4 have been allowed.

Claims 1, 2, 5, 6, 7 and 8 were finally rejected December 26, 1914. The principal references are as follows:-

British patent No. 1122 of 1879
Edison patent No. 263,145, August 22, 1882
Kroa patent No. 780,297, January 17, 1905
Acheson patent No. 875,881, January 7, 1908
British patent 10,815 of 1899.

If the General Electric Company wants this application, Mr. Edison will assign the same to it, and the General Electric Company may then cancel the rejected claims and take out the patent with the claims allowed, or, if it thinks proper, take an appeal on the rejected claims.

The application formerly contained the following claim:-

7. The process of preparing graphite for use in the manufacture of incandescent lamp filaments, which consists in removing silicates, iron and other impurities by treating the graphite with heated caustic alkali and hydrochloric acid and washing it, grinding in the presence of a sticky material, and then washing out the latter, substantially as set forth.

-3-

This claim was canceled in response to a requirement of division by the Office, and may be made the subject matter of a divisional case if the General Electric Company desires to do so.

I am sending you an extra copy of this memorandum in order that you may send it to Mr. Morrison with your letter offering the application to the General Electric Company.

Inasmuch as whatever action is to be taken must be taken prior to the 26th of December, it is desirable that this matter should be attended to promptly.

HL-JS

ALBERT G. DAVIS, ATTORNEY

ALEXANDER F. HODGSON

ALEXANDER G. LIND

ARTHUR A. BICE

JOHN F. BARRETT

FRANK J. BARRETT

CHARLES MULLIN

JOSEPH LYONS

EDWIN A. BURN

HERBERT BRIDGES, JR.

WILLIAM G. GANTNER

DAVID L. WOOD

J. STANLEY PRISTON

WILLIAM W. ANDER

WENTON H. SELL

CLIFFORD M. DAVIS

WALTER C. BOWEN

ALFRED C. BOWEN

WILSON M. DAVIS

RESIDENT ATTORNEYS

BENJAMIN B. HALL, CHIEF CLERK

GENERAL ELECTRIC COMPANY
PATENT DEPARTMENT

SCHENECTADY, N. Y. November 27, 1915.

W.H.Meadowcroft, Esq.,
Care T.A.Edison, Esq.,
Orange, N.J.

Dear Sir:

I am very much obliged to you for your letter of
November 19th.

I am of course disposed to accept Mr. Edison's kind
offer, and would be very much obliged if you would be kind
enough to forward the file of this case to me.

Yours truly,

AGD/CLH

Albert Davis

Mr. Laraman

*This relates to
the other application
we offered them*

*Meadowcroft
11/29/15*

November 29, 1915

Albert G. Davis, Esq.,
Patent Department,
General Electric Company,
Schenectady, New York.

Dear Sir:-

RE APPLICATION OF THOMAS A. EDISON FOR FILMS
FOR INCANDESCENT LAMPS, SERIAL NO. 403,043

In accordance with your letter of November 27th to Mr. Mendoveroff, I am sending you under separate cover the file of the above entitled application and also copies of the references cited therein. Will you kindly acknowledge receipt of these papers. We should also be interested to learn what action you decide to take in the case.

Very truly yours,

HL-JS

ALBERT G. DAVIS, ATTORNEY
ALEXANDER F. MACDONALD
ALEXANDER G. LINT
ARTHUR A. DICE
JOSE P. BARTLEY
FRANK J. SEARLES
CHARLES WELLS
JOSEPH L. LORCH
EDWARD L. BOW
HEPPELT SPOONER, JR.
WILLIAM G. SARTON
DAVID L. WOOD
J. STANLEY FRISCH
WILLIAM W. JONES
MORRIS W. DAVIS
CLYTON R. DRAFFIN
HARRY E. SUTMAN
ALBERT G. DAVIS
ATTORNEY AT LAW
ROBERT B. HALL, CHIEF CLERK

GENERAL ELECTRIC COMPANY
PATENT DEPARTMENT

SCHENECTADY, N. Y. Nov. 30, 1915.

Mr. Henry Lanahan,
Orange, N. J.

Dear Sir:-

In the absence of Mr. Davis, I acknowledge receipt of your letter of November 29th enclosing file of Mr. Edison's application for Films for Incandescent Lamps, Serial No. 403,043. These papers will be called to Mr. Davis' attention as soon as he returns, and I am sure he will be glad to see that you are kept advised of our action in connection with this application.

Yours very truly,



BBH/MW

Folio No. 356

Application for

Serial No. 404,627.

Reissue -

Pat. No. 861819 - granted July 30, 1907.

Applicant

Thomas A Edison

Llewellyn Park
Orange, N.J.

Title Discharging Apparatus for Belt Conveyors

Filed November 30, 1907.

Examiner's Room No R32

Assignee

Ass'g't Exec.

Recorded

Liber

Page

Patent No 13434 Issued June 25, 1912

ACTIONS.

1. Rejection December 6, 1907 16
2. Amended 2, 1908 17
3. Rejection Jan 25, 1909 18
4. Amended Jan 20, 1910 19
5. Rejection Mar 9, 1910 20
6. Amended March 2, 1911 21
7. Rejected April 25, 1911 22
8. Amended April 6, 1912 23
9. 24
10. 25
11. 26
12. 27
13. 28
14. 29
15. 30

VAULT

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

(1)

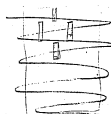
The combination of a ^{travelling} belt conveyor ^{adapted to carry solid particles} or rollers mounted adjacent the same, its upper surface moving in the same direction as said conveyor, means for feeding material to said rollers along a ~~surface of~~ ^{conveyor or} solid particles of ~~material~~ ^{material},

The width to be carried by the conveyor

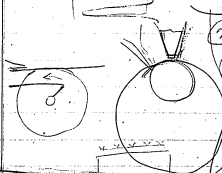
Said rollers having projections forming pockets adapted to receive said material and ~~and said projections acting~~ ^{to} cause the velocity of the rollers to be imparted thereto, and to project the same upon the conveyor, and means for rotating the drum or rollers with a surface speed substantially equal to that of the conveyor, whereby ~~the impact of said solid particles~~ ^{the impact of said solid particles} ~~is~~ ^{is} supplied to said belt and ~~with~~ ^{the velocity of the}



7-1



whereupon the ^{due to the velocity of the} ~~solid particles~~ ^{material} is minimized -



(2) ^{best feeding means known as arranged with respect to} ~~rollers as to prevent~~ ^{solid particles from feeding} ~~from said rollers in~~ ^{from said rollers in} a direction contrary to that of rotation ^{the arrangement of feeding means and rollers then} such as to prevent



The Edison Portland Cement Co.

HENRY H. THOMPSON, PRESIDENT
W. B. MASON, VICE-PRESIDENT
THOMAS A. EDISON, GENERAL MANAGER
WILLIAM D. BIRD, SECRETARY
J. F. HANCOCK, TREASURER

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS. STEWARTSVILLE, N. J.

SALES OFFICES:
PHILADELPHIA, PA., Real Estate Trust Bldg
NEW YORK, N. Y., St. James Building
PITTSBURGH, PA., Machinery Building
NEWARK, N. J., Union Building
BOSTON, MASS., Post Office Square Bldg

Dec. 5, 1907.

Mr. Frank L. Dyer,
Edison Laboratory,
Orange, New Jersey.

Dear Sir:

Replying to your letter of November 22nd, so far we have not made any permanent drawings of the paddle wheel, but have built our experimental ones from sketches. Enclosed you will find sketch which I think will answer your purpose.

If there is any further information you wish, please advise me.

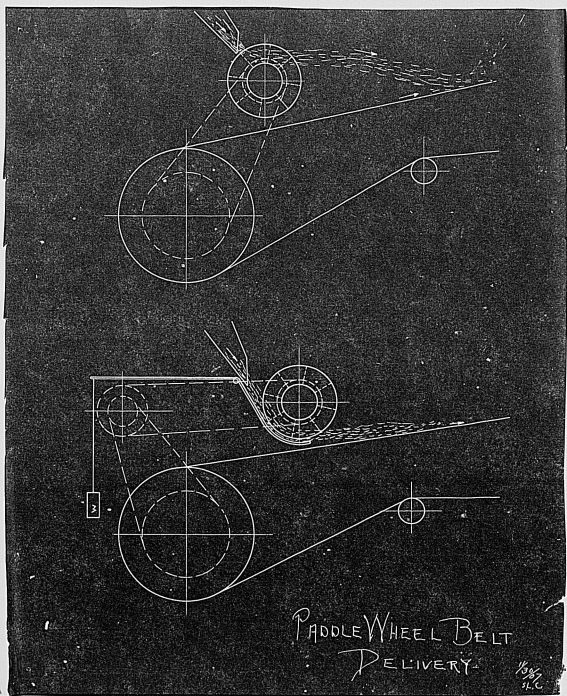
Yours very truly,

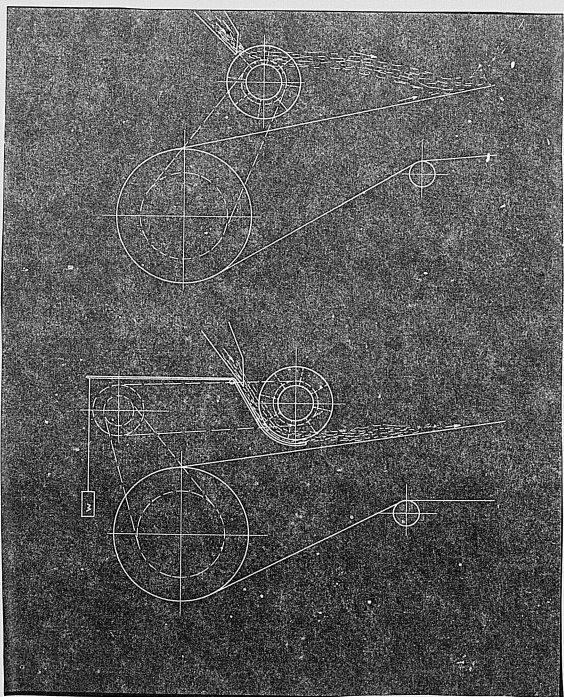
W. B. Mason

WBM-CEM

(enc)

Sup't





Folio No. 870Serial No. 414575

Applicant.

Thomas A. Edison

Address.

Llewellyn Park OrangeTitle Water proofing Paint for Portland Cement
BuildingsFiled February 6, 1908Examiner's Room No. 169Assignee North Jersey Paint Co.Ass'g't Exec. Feb. 2, 1908 Recorded Feb 3, 1908 Liber. 280 Page 6Patent No. 809,167

Issued

Jan 12, 1909

ACTIONS.

- | | | |
|----|------------------------------------|----|
| 1 | <u>Rejected March 12, 1908</u> | 16 |
| 2 | <u>Amended July 20, 1908</u> | 17 |
| 3 | <u>Rejection Aug. 8, 1908</u> | 18 |
| 4 | <u>Amended Aug. 13, 1908</u> | 19 |
| 5 | <u>Allowed Aug 26, 1908</u> | 20 |
| 6 | <u>Final fee due Feb 26, 1908</u> | 21 |
| 7 | <u>Final fee paid Dec 14, 1908</u> | 22 |
| 8 | | 23 |
| 9 | | 24 |
| 10 | | 25 |
| 11 | | 26 |
| 12 | | 27 |
| 13 | | 28 |
| 14 | | 29 |
| 15 | | 30 |

FRANK L. DYER,

Counsel,

Orange, New Jersey.

Dyer Patent July 22 1908
Water proofing paint for Portland Cement constructions
Folio 1379

The invention consists in employing a material known in the petroleum trade as BS it is obtained from Crude Petroleum where it is stored in Tanks. The material is not being soluble to any extent ^{in the petroleum} but is probably held in suspension. The quiet of the tank permits it to settle out. This material ~~in the petroleum~~ does not undergo any change when exposed to light moisture or other atmospheric conditions, and is a very cheap material.

The invention further consists in dissolving the BS in either Benzol, ~~Benzol~~ Petroleum Benzine or Turpentine, in which a large part is soluble.

If it is used in this condition as a water proofing paint the surfaces of the Cement walls are somewhat sticky - but perfectly water proof. The solvent carrying the material some penetration into the ~~for~~ slightly porous cement form in Masonritic Constructions, the solvent evaporating leaves the BS in the pores.

When the stickiness is objectionable as in the ~~interior~~ interior of a house I add an sufficient quantity of ^{strongly} boiled linseed oil to the BS & solvent, in a short time after use the linseed becomes oxidized & retards the adhesive properties of the BS paint without

destroying its waterproofing qualities. —

The mortar further consists in adding to the
paint various pigments & oil colors to produce
various colors. —

In the case of a roof the Bd itself may be
melted to a thin liquid & applied hot,
to the surface of the cement, the adhesive
can then be destroyed by surfacing the
roof with a fine powder like chalk or
clay. —

January 22 1908

703

Folio No. 380

Serial No. 417, 576

Applicant.

Address.

Thomas A. Edison

Llewellyn Park Orange

Title *Metallic film frame with storage batteries electrodes and process of preparing the same.*

Filed February 6, 1908

Examiner's Room No

Assignee Edison Storage Batteries Co.

Ass'g't Exec. May 6, 1908 Recorded May 11, 1908 Liber 3.78 Page 244

Patent No. 876,811

Issued Aug 25, 1908

ACTIONS.

- | | |
|-------------------------------|----|
| 1. Received Apr. 16, 1908 | 16 |
| 2. Final fee due Oct 16, 1908 | 17 |
| 3. " " paid July 24, 1908 | 18 |
| 4. | 19 |
| 5. | 20 |
| 6. | 21 |
| 7. | 22 |
| 8. | 23 |
| 9. | 24 |
| 10. | 25 |
| 11. | 26 |
| 12. <i>pen</i> | 27 |
| 13. | 28 |
| 14. | 29 |
| 15. | 30 |
- pen*
- See application in Germany & England*
- Aug 1908*
- VAULT**
- George H. Thompson*
- when Thompson came*
- 1908*

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

West - floor



no surface
acid treatment
on metal



Commercial
melted - various
impurities such as
arsenic, iron

Dilute solution

metal - for arsenic
hydrochemistry for iron

Folio No. 381Serial No. 414, 924

Applicant.

Address.

Thomas A. EdisonShorellyn Park,Orange,N.J.Apparatus for Recording and Reproducing Motion and Sounds
Title App. for and Proc. of Recording and Reproducing Motion and
SoundsFiled February 8, 1918

Examiner's Room No. _____

Assignee.

New Jersey Patent Co.Ass'g't Exec. Mar. 12, 1914 Recorded _____

Liber _____

Page _____

Patent No. 1182897Issued May 16, 1916

ACTIONS.

- | | |
|--|---|
| 1. <u>Rejected Apr. 11, 1908.</u> | 16. <u>Interference - 37019 declared 12/30/13</u> |
| 2. <u>Reopened Apr. 9, 1909.</u> | 17. <u>Amended Oct. 9 - 1914</u> |
| 3. <u>Office letter May 10, 1909.</u> | 18. _____ |
| 4. <u>Amended May 4, 1910.</u> | 19. <u>Amended Oct. 9 - 1914</u> |
| 5. <u>Office letter June 21, 1910.</u> | 20. <u>Rejected Nov. 4 - 1914</u> |
| 6. <u>Additional Rejection Aug. 9, 1911.</u> | 21. <u>Amended Oct. 16, 1915</u> |
| 7. <u>Amended June 21, 1911.</u> | 22. <u>Rejected Oct. 28, 1915</u> |
| 8. <u>Rejected July 25, 1911.</u> | 23. <u>Amended Oct. 30, 1915</u> |
| 9. <u>Amended June 29, 1912</u> | 24. <u>Allowed Nov. 8, 1915</u> |
| 10. <u>Rejected Oct. 17 - 1912</u> | 25. <u>Final Fee due May 8, 1916</u> |
| 11. <u>Amended Sept. 11, 1913</u> | 26. <u>" " Paid April 1, 1916</u> |
| 12. <u>Rejected Oct. 9 - 1913</u> | 27. _____ |
| 13. <u>Amended Oct. 17 - 1913</u> | 28. _____ |
| 14. <u>Rejected Dec. 4 - 1913</u> | 29. _____ |
| 15. <u>Amended Dec. 10 - 1913</u> | 30. _____ |

FRANK L. DYER,

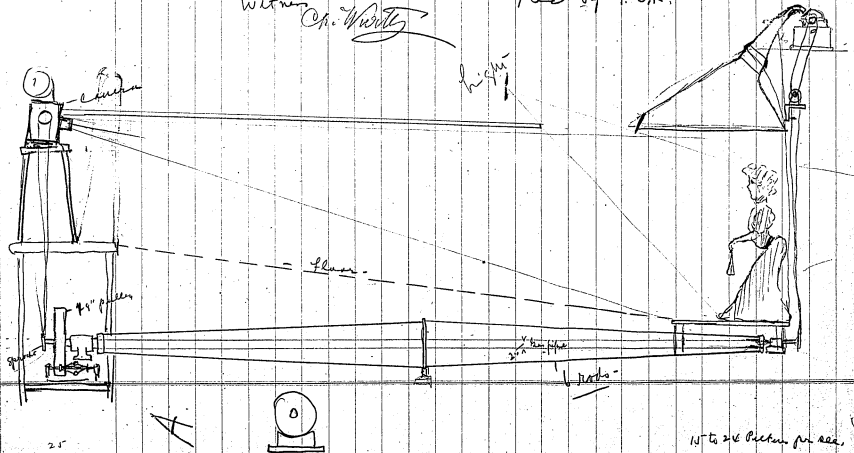
Counsel,

Orange, New Jersey.

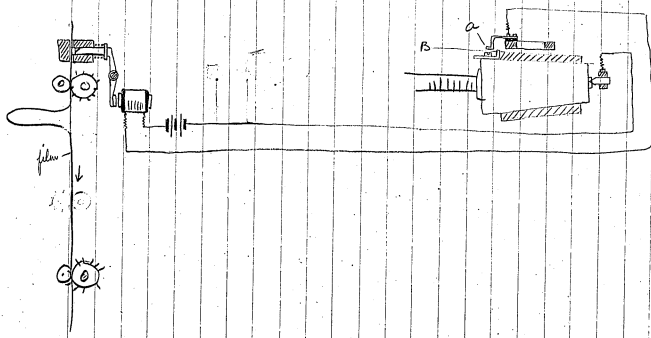
VAULT

The Edison Co.
 Witness
Ch. W. W. W.

Dec 27 1907
 Recd by F. D. Loomis



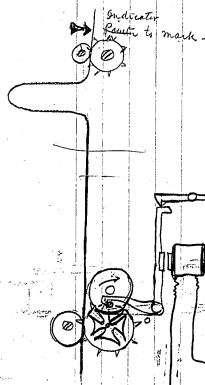
Recording -



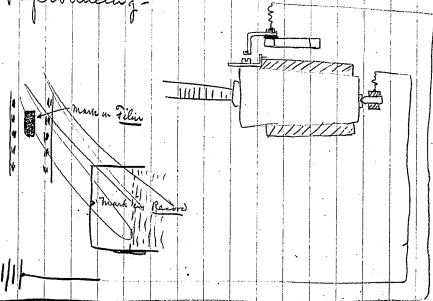
Recording

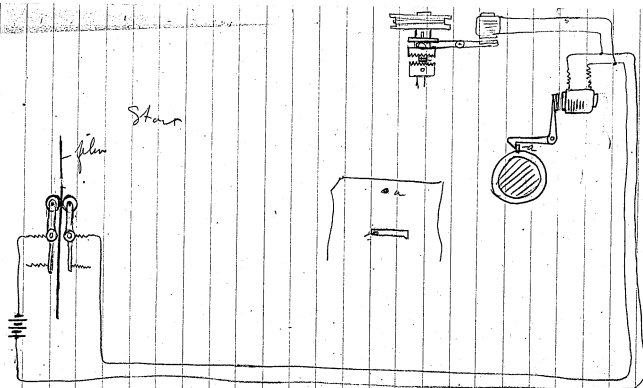
Close the moving picture machine and phonograph together.

When the contact A which is connected to carriage makes contact with B the magnet is energized and a mark is made on the film.

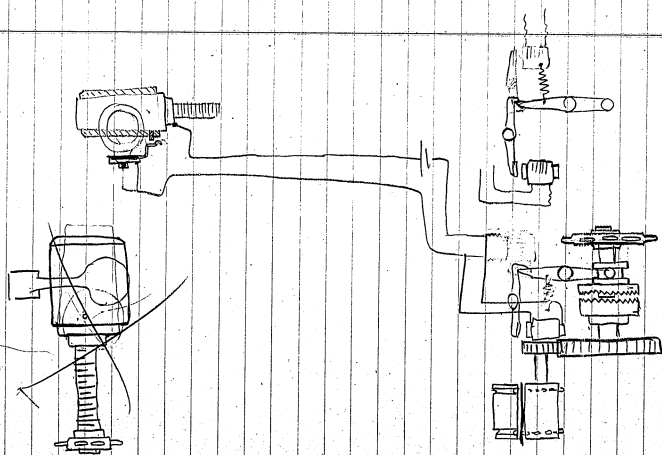


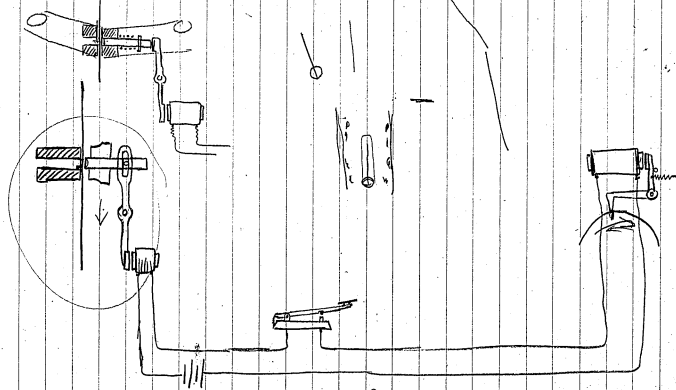
Reproducing -





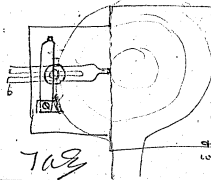
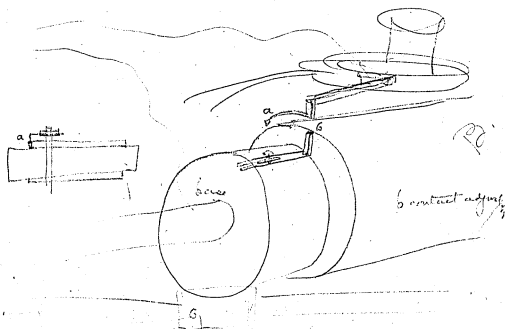
Reproduction





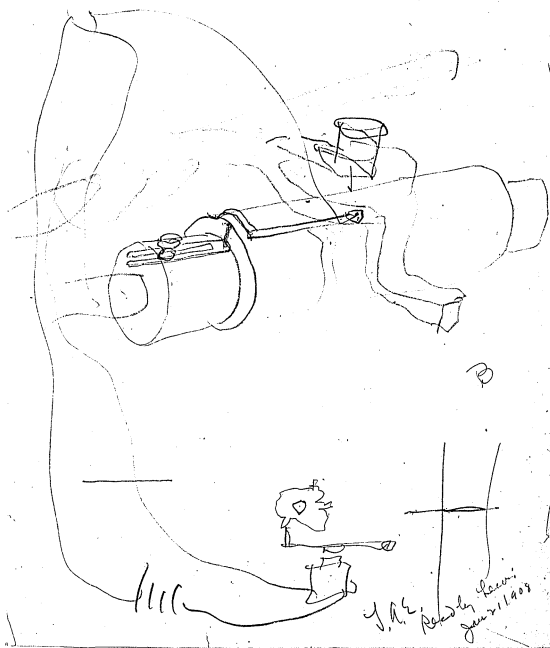
Recording.

Oyer the way I will work the ^{May 22, 1908}
 Kinetograph is to put the electric release
 point on end of the phonograph cylinder



No matter where the
 Record goes when it moves
 on the wheel the point
 b is pushed up against
 end of record + bar
 which always is fixed comes
 along makes momentary contact
 & releases the film counter
 wheel —

to adjust —
 and by Lewis
 May 21, 1908



- SPECIFICATION -

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, Orange, in the County of Essex and State of New Jersey, have invented certain new and useful improvements in APPARATUS FOR AND PROCESS OF RECORDING AND REPRODUCING MOTION AND SOUNDS, of which the following is a description:

In the representation of animate motion by means of moving pictures, much of the effect of the original portrayal is lost by reason of the fact that the scenes are represented in pantomime merely, without the sound which accompanied them when originally produced. For this reason the choice of subjects for representation by means of moving pictures is limited as only such subjects can be successfully represented in this manner as are accompanied by very little sound, scenes in which sound plays a prominent part being incapable of adequate representation to an audience by the mere pantomime exhibition of moving pictures. Likewise, the choice of subjects to be recorded and later reproduced by the phonograph alone is practically restricted to acts and scenes which are accompanied by little or no motion. The adequate portrayal of the great majority of acts and scenes in which both action and sound are present, as for example, the popular "song and dance" act, or the delivery of a public speech by a speaker who talks and moves about and makes gestures at the same time, cannot be accomplished by either the moving picture machine alone or by the phonograph alone, but only

by the simultaneous use of both of these machines.

In order to simultaneously make a moving picture negative and phonograph record of an act or scene during its performance, the camera must be placed at a distance equal to substantially its normal focusing distance from the scene, as will be understood, and the recording phonograph must be placed in the immediate neighborhood of the scene being performed so that the sound may be readily collected and conducted to the recording device. Likewise to secure the realistic reproduction of a scene or act by means of both the moving picture machine and the phonograph, the sounds must appear to emanate from the screen upon which the moving picture is being exhibited and for this reason the phonograph must be placed in the neighborhood of the screen - usually behind it - so that both in making the original record and negative and in reproducing the act or scene, the two machines are separated by a considerable distance, substantially equal to the normal focusing distance of the camera or projecting machine.

As each movement portrayed upon the screen must be accompanied by the sound originally produced simultaneously therewith, it is necessary that at some time, either at the beginning of the operation of the picture machine and phonograph, or shortly thereafter, the two machines shall be made to reproduce movements and sounds which were originally produced at the same instant, and this same identical relation must be maintained throughout the entire reproduction of the performance by the two machines. It has been proposed heretofore to synchronize the operation of the picture machine and the phonograph by actuating these machines by means of synchronized electric motors, but such

devices are uncertain in operation and likely to get out of order, are extremely expensive and have not been found to produce practical results.

The object of the present invention is to provide a novel process and apparatus for making simultaneously a moving picture negative and a phonographic record of sound-producing objects in motion and thereafter simultaneously reproducing the sounds recorded by the phonograph and exhibiting the object in motion by means of moving pictures, the apparatus which I have devised for this purpose being simple and inexpensive to manufacture and certain and reliable in its operation.

In a device constructed and operated in accordance with my invention, a simple mechanical form of driving mechanism is provided to drive both the phonograph and the moving picture camera or projecting machine, according as the device is to be used for recording or reproducing acts and scenes. The form of drive which I have found best adapted for this purpose comprises a long shaft whose length is substantially equal to the distance between the two machines and which may be arranged in any convenient location, as for example, beneath the floor of the room, the phonograph being driven from one end of this shaft and the moving picture camera or projecting machine from the other. If the location of the device is such that a single, straight shaft cannot be used, shorter shafts geared together by bevel or other gears or connected together by universal joints may be used, as will be understood. The shaft may be driven from any convenient source of power, as for example, from an electric motor.

In accordance with my invention, either in making the original record and negative, or in the reproduction of the scene or act, either the phonograph or else the moving picture camera or projecting machine, as the case may be, is first set into operation and the remaining machine is automatically set into operation therefrom. I prefer and have here illustrated the moving picture camera or projecting machine as being started from the phonograph. I consider this the preferable arrangement because the intermittently operating mechanism of the moving picture camera or projecting machine is practically without mass and may be started or stopped substantially instantaneously. With this arrangement I preferably provide means whereby when the recording or reproducing stylus of the phonograph has been carried by the carriage moving transversely of the phonograph record, to a determinate distance from the end of the phonograph record cylinder, the moving picture camera or projecting machine will be automatically set into operation. The mechanism for this purpose will hereafter be fully described. The operation of this mechanism is independent of the position which the record cylinder may occupy on the phonograph mandrel. I also provide means whereby ^{any variation in the longitudinal} position of the phonograph record on the mandrel ^{of the phonograph} does not affect the relative relation between the phonograph record or duplicated thereon may be replaced upon one and the moving picture machine. said mandrel in precisely the same angular relation there-
as originally existed between the master record and the mandrel.

Restoration as
typewriter

In order that my invention may be more clearly understood, I have shown in the accompanying drawings apparatus by which my improved process may be carried into effect. In the figures of the drawing, wherein the same reference numerals are used uniformly to designate the same parts throughout, Figure 1 is a view, partly in longitudinal cross-section, of an apparatus for simultaneously making a moving picture negative and a phonograph record; Figure 2 is a view similar to Figure 1 but showing a moving picture projecting machine and a reproducing phonograph instead of a moving picture camera and a recording phonograph respectively, Figure 3 is a diagrammatic view of one form of means for setting one of the machines into operation from the other, the moving picture camera or projecting machine being here shown as set in operation from the phonograph, and Figures 4 and 5 are detail sectional views of portions of the moving picture camera or projecting machine and the phonograph respectively.

Referring to Figure 1 of the drawings, a recording phonograph is shown at 1 and a moving picture camera at 2. The phonograph is situated in the immediate neighborhood of the stage 3, preferably behind and above it. Immediately above the stage is provided a funnel 4 which collects the sound and conducts it into the receiving horn 5 of the phonograph. Other means for collecting the sound and conducting it to the phonograph may of course be used. The stage 3 is illuminated from a source of light 6. A long drive shaft 7 is used to drive both the camera and the phonograph and it extends from the neighborhood of the

The speed of which is regulated in any suitable way so as to be always uniform, as for instance in the regulation of electric motor for operating phonographs; and the motor in several cases runs faster than is necessary for driving the lens, in order that the speed may not be unnecessarily changed when the moving picture machine is instantaneously started, as will be explained

phonograph to the neighborhood of the moving picture camera, and may be placed in any convenient position, as for example, in the construction shown in the drawing, it is placed beneath the floor of the room. This shaft is mounted in bearings at either end and in order to give it rigidity and at the same time make it as light as possible, it may be provided with a number of stays 8 which are secured to the shaft near its ends and are held apart near the middle of the shaft by a plate or frame work

9. Any form of light rigid shaft may be used, however, as for example, the compound shafting shown in my patent No. 2,716,144 dated Dec 6, 1904. The shaft 7 is driven from any convenient source of power,

as for example, an electric motor 10. One end of the shaft 7 is connected up to drive the moving picture camera or projecting machine and the other end the phonograph. The power is preferably transmitted from the shaft through sprocket chains and sprocket wheels, so that all possibility of slip may be obviated, although it is obvious that pulleys or gears might be used. The proportions of the power transmitting devices are such that the moving picture camera or projecting machine and the phonograph is each operated at its own proper speed. In transmitting the power to the phonograph a counter-shaft 11 is preferably provided so that the phonograph may be placed in slightly different positions as shown in Figures 1 and 2.

Referring now to Figure 2, 12 represents a reproducing phonograph and 13 a moving picture projecting machine. The driving apparatus for these two machines is the same or precisely like that used for the recording phonograph and the moving picture camera, so that when

the two machines have once been gotten to working in unison they will continue to operate in unison and the sounds and motions will be reproduced simultaneously as they were originally produced.

The mechanism for automatically setting the moving picture camera into operation from the recording phonograph and for setting the moving picture projecting machine into operation from the reproducing phonograph, is shown in Figure 3. In this view 14 represents the phonograph mandrel, 15 the carriage which is movable transversely of the phonograph mandrel and the cylindrical blank or record thereon, under the control of the rotating feed screw 16. These parts are of ordinary construction. The carriage 15 carries a recorder when the instrument is used for recording and ^athe reproducer when it is to be used for reproducing, as will be understood. Near the larger end of the mandrel 14 and adjustably secured thereto by means of a screw 17 is a small bracket 18 provided with a longitudinal slot 19 through which the screw 17 is passed. The end of this bracket next to the record or blank cylinder is formed with a sharp edge ^(forming a contact piece) 20 and an upward projection 21. Secured to the carriage 15, and insulated therefrom, is a contact piece 22. This contact piece may be made of light metal so that it may be easily adjusted by bending; or other means for adjusting it may be provided. The branches of an electric circuit 23 are connected respectively to the mandrel 14 and the contact piece 22, so that when the contact piece 22 strikes the extension 21 of the bracket 18, the circuit will be closed. This circuit includes the coils of an electro magnet 25. The armature 26 of the magnet 25 is carried upon a lever 27 here shown as a bell-

crank-lever, forming a part of the device used when the electric circuit is closed as above described, to set into operation the moving picture camera or projecting machine, a sectional plan view of which is shown in Figure 4. 28 indicates a gear wheel, ^{continuously} connected to ^{the shaft 7} a preferably continuously operating source of power and meshing with a pinion 29, which operates to continuously rotate a disk 30 carrying a friction member such as a friction disk 31. The friction disk 31 bears against the actuating disk or pin wheel 32 which when rotated actuates the intermittent feed device of the moving picture camera or projecting machine. The disk 32 is normally held from rotation by a hook 33 ^{on the lever 27 and} engaging a pin 34 on the said disk 32.

When the circuit 23 is closed by the contact pieces 21 and 22, the magnet 25 being energized, the hook 33 is drawn away from in front of the pin 34, and the intermittent feed device of the camera or projecting machine is permitted to rotate under the control of the friction member 31. A pawl 35 holds the lever 27 retracted when once drawn back by the magnet 25.

The operation of the devices which have been described is as follows: When the original performance of the act or scene is to be recorded upon the phonograph or photographed by the moving picture camera, a record blank is placed upon the tapering mandrel 14 of the phonograph and pushed thereon until it binds. The bracket 18 is then pushed against the end of the record blank and secured in place by means of the screw 17, the sharp edge 20 making a slight but readily visible mark in the end of the blank.

Ordinarily an announcement of the act or scene to be recorded, will be made by the phonograph before the circuit is closed, and the moving picture camera is started. With some machines this announcement may be made to immediately precede the actual scene, so that there will be no unnecessary delay.

A sensitized film is placed in the camera with a previously marked portion thereof opposite the light aperture. The stage is now illuminated and when the performers are ready to begin the performance the electric motor 10 is set into operation and the phonograph is driven thereby. As the phonograph is operated the contact piece 22 is moved transversely of the mandrel and record blank by means of the carriage 15 and comes into contact with the projection 21, and the circuit 23 being thus closed the camera is automatically set into operation by the mechanism already described, ^{whereupon the act or performance which is to be photographed, is recorded and recorded photographically in commences.}

In order to reproduce the scenes and movements thus recorded and photographed, a positive film is made from the negative film by a direct printing process so that it is an exact duplicate thereof, and this positive film is placed in a projecting machine which is substituted for the moving picture camera, with the same point of the film opposite the projecting aperture as was opposite the exposure aperture ^{when the picture was taken} when the picture was taken. A duplicate record made from the original master record is placed on a reproducing phonograph which is substituted for the recording phonograph in use during the original production of the act or scene, and the bracket 18 upon this phonograph is secured against the end of the record by means of the screw 17, the record having been turned to the same angular position upon the mandrel as was occupied by the master record. The original record may be used for reproduction upon the phonograph, in which case a phonograph with a feed screw having precisely the same pitch as that on the original recording phonograph will be used. If,

*The assumption
made of the
act or scene
having first
been reproduced
phonographically,
as will be un-
derstood.*

however, a duplicate record made by the usual molding process is used for reproduction, (since the material from which the ~~original film~~ such duplicate molded records are made, shrinks somewhat during the process of cooling, and the record is therefore somewhat shorter than the original master record;) a phonograph is used having a feed screw of somewhat smaller pitch than that of the phonograph used for recording. Such records shrink symmetrically throughout their length and the amount of such shrinkage is definitely known and may be accurately compensated by a change in the pitch of the feed screw as above indicated. The machines having been thus arranged, the phonograph is set into operation by starting the motor 10 and when the contact pieces 21 and 22 strike against one another the moving picture projecting machine will be set into operation when the reproducing stylus of the phonograph has reached a point on the record corresponding precisely with the point on the positive film at which the latter is set into motion. The two machines having been set into operation in the desired relation and ^{being} driven by driving mechanism identical with that used during the performance of the original act or scene, this desired identical relation will continue throughout the reproduction of the act or scene. Portions of the film corresponding to the successive phonograph records may be joined together by blank pieces of film, and as soon as the display of one such section has been completed, the lever 27 may be released from the pawl 35, when the moving picture machine will come to a stop. The record cylinder upon the phonograph may now be replaced by the record cylinder corresponding to the succeeding portion of film, and the new section of film properly positioned upon the pro-

While passing
to so arrange
the operation
that the moving
picture machine
will be supplied
from the photo-
graph, owing to
the extremely
small space in
the moving picture
film frame, yet
it will be possible
to show the
reverse of the
image, and the
moving picture
starting from, and
after the com-
pletion of
operation of the
moving picture
machine.

see operation
see page 1

jecting machine, the bracket 18 properly adjusted and, as soon as the contact piece 22 strikes the contact piece 21 the projecting machine will again be set into operation, and the performance can thus be continued until the entire length of film in the magazine of the moving picture projecting machine and the corresponding records have been exhausted.

Having thus described my invention, I claim:

1. The process of simultaneously taking a motion photograph with a moving picture camera and making a record upon a recording phonograph, the phonograph and camera being separated by substantially the normal focusing distance of the camera, and thereafter reproducing the recorded sounds and exhibiting the moving pictures photographed in substantially the same relation, substantially as set forth.

2. The process of recording and reproducing sound and motion which consists in simultaneously making a sound record and a moving picture negative, printing a positive film from the said negative film, making a duplicate of the said sound record, reproducing the sound so recorded upon a phonograph, and starting the exhibition of the positive film from the phonograph, substantially as set forth.

3. The process of simultaneously exhibiting motion pictures and reproducing sounds which consists in first beginning either of the said operations and thereafter automatically starting the remaining operation at a given stage in the first named operation, substantially as set forth.

3. The process of simultaneously exhibiting motion pictures and reproducing sounds which consists in first beginning either of the said operations and thereafter automatically starting the remaining operation at a given stage in the first named operation, substantially as set forth.

4. The process of simultaneously exhibiting motion pictures and reproducing sounds, which consists in first starting the reproduction of sound and thereafter automatically starting the exhibition of motion pictures, when a given stage in the reproduction of sound has been reached, substantially as set forth.

5. The process of simultaneously exhibiting moving pictures and reproducing sounds, which consists in first setting a phonograph in operation to reproduce the recorded sounds and in automatically starting the exhibition of moving pictures from the phonograph when the reproduction of the sound thereby has reached a given stage, substantially as set forth.

6. The process of simultaneously exhibiting motion pictures and reproducing sound which consists in actuating the sound reproducing and picture exhibiting machines from a common actuating mechanism and setting the moving picture exhibiting machine into action from the sound reproducing machine, substantially as set forth.

7. The process of simultaneously exhibiting motion pictures and reproducing sounds, which consists in marking a point upon a motion picture film corresponding to a particular point upon a sound record, in reproducing sounds

recorded upon the record, and in automatically starting the exhibition of moving pictures at the indicated point when the sounds recorded upon the record at the corresponding point are being reproduced, substantially as set forth.

72 8. The process which consists in making a sound record and a moving picture negative upon a recording phonograph and a moving picture camera respectively, actuating the same by a common actuating means, replacing the recording phonograph by a reproducing phonograph, and the camera by a projecting machine, exhibiting in the said projecting machine a positive film which is a duplicate of said negative, and reproducing upon the phonograph the record originally made, or a duplicate thereof, substantially as set forth.

9. The combination of a moving picture camera, a recording phonograph at substantially the normal focusing distance of the camera therefrom, and mechanical actuating means common to both the camera and the phonograph, substantially as set forth.

10. The combination of a moving picture camera, a recording phonograph at substantially the normal focusing distance of the camera therefrom, a rigid shaft extending from the neighborhood of the phonograph to the neighborhood of the camera and serving as a common actuating means for the two machines, substantially as set forth

11. The combination of a moving picture projecting machine, a reproducing phonograph at substantially the normal focusing distance of the camera therefrom, a rigid shaft serving to drive both the camera and projecting machine and extending from the neighborhood of one of the machines to the neighborhood of the other, substantially as set forth.

12. The combination of a screen, a moving picture projecting machine at a distance therefrom and so positioned as to display moving pictures thereon, a talking machine in the neighborhood of the screen, a long shaft extending from the neighborhood of the talking machine to that of the projecting machine and operatively connected to the said machines, and means for driving the said shaft, substantially as set forth.

13. The combination of a screen, a moving picture exhibiting machine trained thereon, a phonograph in the neighborhood of the screen, a long shaft extending from the neighborhood of the phonograph to the neighborhood of the projecting machine, the said shaft being directly geared to one of the said machines, and adapted to be operatively ^{connected} ~~clashed~~ to the remaining machine, substantially as set forth.

14. The combination of a screen, a moving picture projecting machine trained thereon and at a distance therefrom, a phonograph in the neighborhood of the said screen, a long shaft extending from the phonograph to the projecting machine and directly geared to one of said machines, and means under the control of the machine directly connected to the shaft for operatively connecting the re-

maining machine to said shaft, substantially as set forth.

15. The combination with a floor, of a phonograph and a moving picture projecting machine supported thereby, and separated by a considerable distance, a long shaft extending beneath the floor and adapted to actuate both the phonograph and the projecting machine, substantially as set forth.

Power here

16. In a device of the character described, the combination of a reproducing phonograph, a sound record thereon, a moving picture projecting machine, a positive film threaded therein, actuating means positively geared to one of the said machines, and means for operatively connecting the said actuating means to the other of the said machines at a definite point in the operation of the first named machine, substantially as set forth.

17. In a device of the character described, the combination of a reproducing phonograph, a sound record thereon, a moving picture projecting machine, a positive film threaded therein, actuating means positively geared to the said phonograph and means under the control of the said phonograph for operatively connecting the moving picture projecting machine to the said actuating means at a definite point in the movement of the said record, substantially as set forth.

18. In a device of the class described, the combination of a rotating mandrel, a progressively moving carriage, a reproducer borne by the said carriage, a sound record, means for rotating said record beneath the said carriage and reproducer, a contact piece secured to the said mandrel,

a second contact piece secured to the said carriage, an electro-magnet, a normally open circuit comprising the coils of the electro-magnet and adapted to be closed when the said contact points strike together, a moving picture projecting machine, and means under control of the said magnet for setting the said moving picture projecting machine into operation, substantially as set forth.

19. In a device of the class described, the combination of a reproducing phonograph comprising a rotating mandrel and a traveling carriage, a sound record upon said mandrel, a contact piece upon said mandrel and a co-acting contact piece upon said carriage, an electro-magnet, a normally open electric circuit including the said contact pieces and the coils of the electric magnet, actuating means for the said phonograph, a moving picture projecting machine, and means under the control of the said magnet for operatively connecting the said projecting machine to the phonograph actuating means, substantially as set forth.

20. In a device of the character described, the combination of a reproducing phonograph comprising a rotating mandrel, a traveling carriage and a reproducer equipped with a stylus adapted to track a sound record groove, a sound record upon said mandrel, a contact piece upon said mandrel, a co-acting contact piece upon the said carriage adapted to be struck by the first-named contact piece when the stylus has reached a given point upon the record groove, a moving picture projecting machine, actuating means for the phonograph, an electro-magnet, a normally open electric circuit including the said contact pieces and the coils of the electro magnet,

and means under the control of the said magnet for operatively connecting the moving picture machine to the means for actuating the phonograph, substantially as set forth.

AN In a device of the character described, the combination of a reproducing phonograph comprising a rotatable mandrel, a sound record thereon, a contact piece upon said record, a movable contact piece adapted to be struck by the first named contact piece in its rotation with the mandrel, an electric circuit normally open and adapted to be closed by the said contact pieces, an electro-magnet the coils whereof are included within the electric circuit, a moving picture projecting machine and means under the control of the said magnet for setting the said projecting machine into operation, substantially as set forth.

Fig. 15
22. In a device of the character described, the combination of a reproducing phonograph, a sound record thereon, a moving picture projecting machine, a positive film inserted therein, and means under the control of the phonograph for setting the projecting machine into operation, substantially as set forth.

23. In a device for simultaneously reproducing sounds and exhibiting motion-pictures, the combination of a reproducing phonograph, a sound record thereon, a moving picture projecting machine, a positive film threaded in said projecting machine, common actuating means for the said phonograph and projecting machine positively geared to the phonograph, means for preventing the operation of the projecting machine, and means ~~for~~ automatically actuated by the phonograph ~~by the phonograph~~ for releasing the said preventing means, substantially as set forth.

24. In a device of the character described, the combination of a reproducing phonograph, a sound record thereon, a moving picture projecting machine, a positive film threaded therein, common actuating means for the said phonograph and projecting machine, positively geared to the said phonograph and adapted to be operatively connected to the said projecting machine, and means under the control of the phonograph record in its movement for operatively connecting the projecting machine to the actuating means, substantially as set forth.

Apparatus for Recording & Reproducing Motion & Sound
Patented Nov 19 1907 Inventor O. G. Edison

Device shown in Figure 3. Dec 27
Oct 27 1907

Date of conception — Dec 27 1907

Date on which drawings were made — Oct 27 1907

Date of explanation of device of Dec 27
Figure 3 to three Oct 27 1907
(James H. P. & W. H. L.)

Date when device of Fig. 3
was first embodied in complete
full-sized machine & successfully
operated May 1908

Have any other machine
embodying the invention been
made & used? No.

Folio No. 384

421,888
Serial No. 384

Applicant.

Address.

Thomas A. Edison

Hershey Park

Title Phonograph Reproducers

Filed March 15, 1908

Examiner's Room No. 379

Assignee J. P. Pat. Co.

Ass'g't Exec. Jan. 20, 1911 Recorded Jan. 25, 1911 Liber 986 Page 78

Patent No. 996,625

Issued July 4, 1911

ACTIONS.

- 1 Rejection April 8, 1909 16
- 2 Amendment suggested Feb 6, 1910 17
- 3 Claim added Feb 13, 1910 18
- 4 Interference declared Mar 26, 1910 19
- 5 Rejected Jan 6, 1910 20
- 6 Amended to p. 15, 1911 21
- 7 Allowed Jan 19, 1911 22
- 8 Amended Jan 20, 1911 23
- 9 Amendment admitted by Office Feb 11, 1911 24
- 10 Letter to office calling attention 25
- 11 to error in patent July 3, 1911 26
- 12 _____ 27
- 13 _____ 28
- 14 _____ 29
- 15 _____ 30

FRANK L. DYER,
Counsel,
ORANGE, NEW JERSEY.

Legal Department.

Telephone 200 Cranger.
Cable Address: Ed Legal Cranger.

Thomas A. Edison
National Phonograph Co.
Edison Business Phonograph Co.
Edison Manufacturing Co.
Bates Manufacturing Co.
Edison Storage Battery Co.
Edison Portland Cement Co.

Frank L. Dyer, General Counsel

Dyer

Cranger, N.J. Feb. 26, 1909

Abandon this. It never can be
made practicable. I had it in
an old Convention years ago

Mr. Thomas A. Edison,
Port Myers, Florida.

My dear Mr. Edison:

You invention, which has for its object the elimination of the friction caused by the sliding of the stylus over the record surface by providing a stylus in the form of a roller or ball and rotatably supporting the same so that it rolls along the record surface, has been put in an interference. Mr. Wolke made a working drawing of this for you on February 12th, 1908 and made the model immediately thereafter. Mr. Wolke does not seem, however, to have any original sketch of this having a date prior to that of his working drawing, and the question is whether you can remember the date on which you conceived this invention and the date on which you first made a drawing showing the invention. Any evidence which you might be able to rake up to carry the date of the invention back of February 12, 1908 would be of service. The application was filed in March 1908.

Yours very truly,

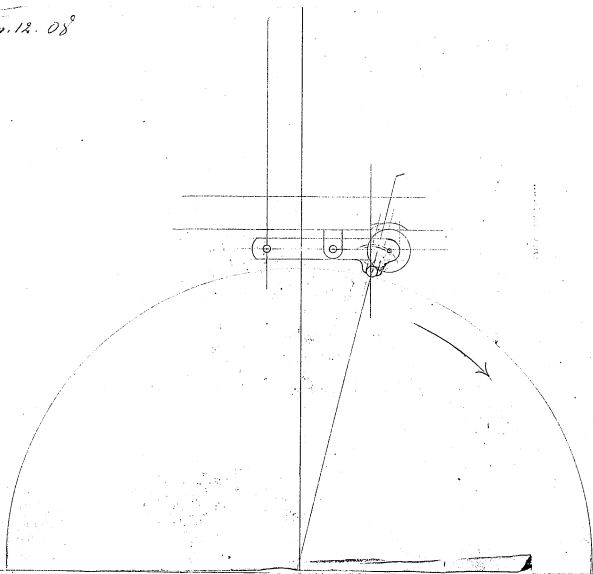
Frank L. Dyer
per Dyer Smith

DS/JS

RECEIVED.

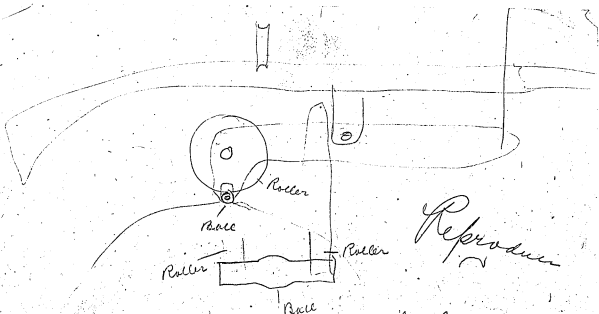
MAR 6-1909
FRANK L. DYER.

July 12. 08



U.S. PATENT OFFICE
WASHINGTON, D.C.

1898



Reproduction

*L.A. Edison Inv.
Rec'd by Lewis
Det'n. 1908*

By this method a heavier weight can be used.

Dir x

C. T. (p. 10) 1/2

Case 8 May - 07

Weight of case when in hand
in March 07

Ex 1 -



M. G.

Ex 2



Wheel in a fork. Bagging machine.
(when?)

Ex 3



(when?)

Steel bagging

May - 07

Ex 4 -

Ball in socket.

Swim in ball too
large for pendulum.

Played in Ed. speed &
machine.



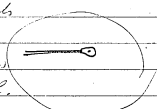
(when?) June 07

Ex 5 -

Developed tool for making balls
1/32" diam.

Ball in socket with screw
for adjusting play of ball.
Result in Sept. 07.

Then tried in Ed. speed machine
Kinner etc.



Father's ball, day
Sept 4 - 07 - with
afterwards later.

Acc 11 models of finished
of this made by Phil.
Wainwright & 2, each
(mach. + closed) - 1 each
(made by some other party?)

Ex 6

Small tool for ball making

2 discs with circular
grooves, mounted
in die press



[ON BACK OF PRECEDING PAGE]

Machine in which styles mounted
& played in Sept 07

Ex 7.

Had machine since Jan 17-07-

2 other reproduces, in which styles
might have been mounted in Sept 07-

8 & 9

if not in reproduces shown in Ex 5-

Billed by B. L. B. May 6-07-
drilling holes in castings. (Ex 3)

10

Billed for phone, Jan 19-07

11

Preface Statement

- (1) Conception - before Feb 12 08
- (2) sketch -
3. Feb. 12 08? Discharge rollers
4. Feb. 14 & 15 08? Re-creation
5. Extent of use -
6. No foreign appls.

Folio No. 385

Serial No. 421887

Applicant.

Address.

*J. A. Edison*Title *Process of Making Photographs Records*Filed *Mar. 18 1908*Examiner's Room No. *379.*

Assignee.

Ass'g't Exec. _____ Recorded _____ Liber _____ Page _____

Patent No. _____ Issued _____

ACTIONS.

- | | | | |
|----|---|----|-----------------------------------|
| 1 | <i>Rejected Apr 2 1908</i> | 16 | <i>Dr. offered as fee advance</i> |
| 2 | <i>Amended Mar 25 1909</i> | 17 | <i>of Mr. Dyer</i> |
| 3 | <i>Rejected April 14 1909</i> | 18 | <i>Sep 3, 1912</i> |
| 4 | <i>Amended Apr 7 1910</i> | 19 | |
| 5 | <i>Finally rejected Apr 25 19020</i> | 20 | |
| 6 | <i>Appeal to Examiners in Chief July 21</i> | 21 | |
| 7 | <i>Examiners statement Apr. 24 1911</i> | 22 | |
| 8 | <i>Brief for appellant filed Aug 19 11</i> | 23 | |
| 9 | <i>Decision Examiners in Chief 7/6/11</i> | 24 | |
| 10 | | 25 | |
| 11 | | 26 | |
| 12 | | 27 | |
| 13 | | 28 | |
| 14 | | 29 | |
| 15 | | 30 | |

FRANK L. DYER,
Counsel,
ORANGE, NEW JERSEY.

3-385.

Case 6.

Petition.

To the Commissioner of Patents:

Your Petitioner **THOMAS A. EDISON**
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, County of Essex and State of New Jersey;

prays that letters patent may be granted to him for the improvements in

PROCESS OF MAKING PHONOGRAPH RECORDS,

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration No. 560), of Orange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thomas A. Edison

- SPECIFICATION -

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States, and a resident of Llewellyn Park, Orange, County of Essex and State of New Jersey, have invented certain new and useful improvements in PROCESS OF MAKING PHONOGRAPH RECORDS, of which the following is a description:-

The wax-like compositions now in common use for making phonograph records, such, for example, as those described in Patent No. 782,375, granted to Jonas W. Aylsworth, have qualities which make them specially well adapted for this purpose. Such materials can be readily molded, give an accurate copy of the surface of the mold or matrix, and after being molded can be reamed out and trimmed off and otherwise worked with great facility. Phonograph records can be made from these materials at low cost, with simple machinery and by very cheap labor. It is a fact, however, that records made from these wax-like compositions, and made, as is now the common practice, with substantially one hundred record grooves to the inch, after being subjected to a large number of reproductions in the phonograph, show signs of wear and the character of the reproduction obtained therefrom deteriorates. Obviously, such records will be more rapidly worn when a narrower record groove and a reproducing stylus of correspondingly decreased size are made use of. It is desirable, therefore, that a record

be made which will have a harder and tougher wearing surface and which will at the same time retain the good moldable and workable qualities of the records made from the wax-like compositions now used.

I have disclosed in an application filed on even date herewith, serially numbered _____, a record having these characteristics, and I propose in the present application to describe and claim an effective process by which such records may be manufactured. In the practice of my improved process I take first the ordinary mold or matrix which has been made from a master record, and which is used for molding duplicates, and apply a coating to the negative record surface on the interior of this mold or matrix, of a material which, when welded to the record surface of a record made from the moldable material, will give the said record a hardened and toughened surface. For such hard and tough material I may make use, for example, of celluloid or nitrated cellulose, dissolved in a suitable solvent, such as amyl acetate or a mixture of alcohol and ether, etc. I preferably apply this material to the inner face of the mold by immersing the mold in such a solution and after the mold is withdrawn from the solution I preferably allow it to dry in a vertical position, so that there will be no tendency for the solution to gather at one side of the mold, and after it has dried so that nearly all of the volatile solvent of the collodion solution has been eliminated, I use the mold for molding a record therein, using for this purpose any of the materials well-known in the art, and preferably the wax-like composition now commonly used for this purpose. The molding may be done in any well-known fashion, either by dipping the mold into the moldable ma-

terial and allowing it to congeal on the inner surface of the mold, and then withdrawing the mold with its coating before the mold itself has had time to become heated, as disclosed in patent No. 683,615, granted to Miller and Aylsworth on October 1, 1901, or, I may mold the material by pouring, for example, as disclosed in the patent to Maurice Joyce, No. 831,668, dated September 25, 1906, or, I may make use of centrifugal force for molding the material, the mold being rapidly rotated during the formation of the record, as disclosed in patent to Jonas W. Aylsworth, No. 855,605, dated June 4, 1907, or, I may make use of other ways known in the art for molding the material. In any case, when the material is placed in the mold and allowed to cool in contact therewith, the film of collodion which was placed upon the record surface of the mold, before the wax-like or other moldable material was introduced therein, will become firmly welded to the outer surface of such material in such a way that when the record is used for reproduction, the reproducing stylus will not tear or detach the collodion film.

It is evident that the record groove and the undulations thereof in a record produced in this manner, will be unaffected by the provision of the record with a hardened surface, since the complete record groove will be accurately molded with the hardened surface film. By this process I am enabled to make use of a collodion or other surface hardening film of any desired thickness and in no manner detract from the reproducing qualities of the record, while I add very greatly to its life and wearing qualities. The thickness of the film may be governed, as will be understood, by controlling the proportion of solvent in the solution,

a thin solution giving a thinner film and a thicker solution a thicker film, and if it is found to be necessary, in order to produce a sufficiently thick film, the mold, after being immersed and dried, may be immersed and dried a second or even a third time.

Having now described my invention, I claim:-

1. The process of making a phonograph record which consists in providing a mold having a negative impression of the record, coating the mold with a material adapted to harden the surface of a record and molding therein a record from moldable material, substantially as set forth.

2. A process of making a phonograph record which consists in providing a mold carrying a negative impression of the record, applying to said mold a film of material adapted to harden the surface of the record, and molding a wax-like composition therein to form a record having a hardened surface, substantially as set forth.

3. The process of making a phonograph record which consists in providing a mold carrying the negative impression of the record, applying a film of collodion to said mold, and molding wax-like material in said mold, substantially as set forth.

4. The process of making a phonograph record which consists in providing a mold having a negative impression of the record, applying a coating of collodion solution to the mold, drying the mold in a vertical position, and molding a record of moldable material in said mold, substantially as set forth.

solidly, rotating the mold in a vertical position, immersing it in a wax bath, and drying it in a vertical position. On a separate sheet, I have shown the process of making a record by coating the mold with a collodion solution, drying the mold in a vertical position, and molding a record of moldable material in said mold, substantially as set forth.

#2. The process of making a phonograph record, which consists in providing a mold carrying a negative impression of the record, coating the mold with a layer of collodion solution, molding a record therein from wax-like composition, thereby causing collodion to be intimately welded to the wax-like composition at its surface, allowing the record so formed to contract and withdrawing it longitudinally from the mold, substantially as set forth.

Inventor A. C. Blain Apr 7, 1910.

add claim limited
to another material.

This specification signed and witnessed this 13 day of March 1908

Witnesses:

Thomas A. Edison

1. Frank L. Dyer
2. Anna R. Klehm

Oath.

State of New Jersey } ss.,
County of Essex

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Orange, County of Essex and State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the improvements in PROCESS OF MAKING PHONOGRAPH RECORDS,

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 13 day of March 1908

Thomas A. Edison
Frank L. Dyer
Notary Public.

[Seal]

2-260.

385

Div. 23. Room 379
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

J.H.D.-Li.

Paper No. 1, Rej.
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

April 1, 1908.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.

Edison Laboratory.

Please find below a communication from the EXAMINER in charge of your application,

for Process of Making Phonograph Records, filed March 18, 1908, serial
number 421,887.

E. B. Moore

Commissioner of Patents.

Applicant is requested to file a drawing diagrammatically
illustrative of the present process.

The claims do not appear to specify matter distinguishable
in a patentable sense from patents of Petit, Dec. 24, 1901, #689,408,
(181-16); Harris, Dec. 11, 1906, #837,927, and the acknowledgedly old
record material employed by applicant, it being held that in so far
as the specific process is concerned, it could not constitute
invention to substitute wax-like material for Petit's celluloid like
material employed in constructing the base of his record.

The claims drawn are rejected.

Ref

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)	
	:	
PROCESS OF MAKING)	
PHONOGRAPH RECORDS	:	
	)	Room No. 379.
Filed March 18, 1908	:	
)	
Serial No. 421,887	:	

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to Office action of
April 2, 1908, please amend the above entitled case as
follows:

Cancel Claim 1.

Claim 2, line 5, after "therein" insert - by
centrifugal means - .

Cancel Claim 3.

Renumber Claims 2, 4 and 5 as 1, 2 and 3.

R E M A R K S

A drawing diagrammatically illustrative of the
parts will be filed before the case goes to issue.

Reconsideration and allowance of the claims
remaining in the case are requested. The reference
Harris would not seem to be particularly pertinent in this
case, his disclosure being a surface of celluloid on a
backing of wood-pulp. Petit discloses a process some-
what similar to applicant's, but applicant's process

as now claimed is specifically different therefrom.
Applicant's method of applying the coating to the inside
of the mold and drying the same is different from Petit's,
and applicant also molds a record within this coating as
by centrifugal means, whereby the collodion film is
caused to be intimately welded to the wax-like composition.

Respectfully submitted

THOMAS A. EDISON

By _____

His Attorney.

Orange, New Jersey

March , 1909.

281
Div. 23, Room 379
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."
J. H. D., -G.A.

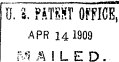
8-260.

Paper No. 3,793
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

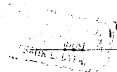
DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.

April 14, 1909.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application,
for Process of Making Phonograph Records, filed March 18, 1908,
serial number 421,887.



E. B. Moore

Commissioner of Patents.

This action is in response to the amendment filed the
25th ultimo.

The examiner can see no patentable distinction between
Petit's process and that set forth in applicant's claims.
Whether the base material be wax-like as is most common in the
art or not wax-like, does not seem to be material in so far as
the patentability of the process is concerned. However, a wax-
like base and a hard record surface are shown in Harris cited.

The examiner must hold that the claims do not set forth
patentable invention over Petit's disclosure and that of Harris,
and the claims are accordingly rejected.

Seems

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)

PROCESS OF MAKING PHONOGRAPH
RECORDS)

Filed March 18, 1908)

Serial No. 421,887)

Room No. 579.

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of April 14,
1909, please amend this case as follows:

✓ Cancel Claims 1 and 2 and substitute the
following:

1. A process of making a phonograph record which
consists in providing a mold carrying a negative im-
pression of the record, applying to said mold a film of
material adapted to harden the surface of the record,
drying the mold, rotating the mold, introducing therein
a wax-like composition in molten condition, and molding
the same by centrifugal action in intimate contact with
the hardened surface film, cooling the record so made,
and withdrawing from the mold the finished record of wax-
like composition having a hardened surface film intimately
welded thereto, substantially as set forth.

✓ Renumber Claim 3 as Claim 2.

R E M A R K S

Reconsideration and allowance of the claims as amended are respectfully requested. The process as claimed could not be carried out by Petit, the base material of whose record is celluloid. Neither could it be carried out by Harris, whose base material is wood pulp. By applicant's invention as described in Claim 1, a wax-like record is made by a centrifugal process having a hardened surface film thereon, and this is done in a particular way claimed, which is thought to be patentably different from anything shown in the references. Claim 2, previously 3, is also thought to be specifically different from the references.

Respectfully,

THOMAS A. EDISON

By

Frank H. Dyer
Attorney.

Orange, N. J.

April 7, 1910.

385

2-260.

Div. _____ Room _____ 379

ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
J. H. Dwyer,
C.

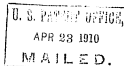
Paper No. _____ 5-11, Reg.
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

April 23, 1910.

Thomas A. Edison,
Care Frank E. Dyer,
Orange, New Jersey.



Edison Laboratory.

Please find below a communication from the EXAMINER in charge of your application,

for Process of Making Phonograph Records, filed March 18, 1908, serial
number 421,687.

E. B. Wood.

Commissioner of Patents.

This action is responsive to the amendment filed April
3, 1910.

Claim 1 is objectionable in line 5. Drying the mold
and rotating the mold are one and the same step in the process.

After a careful consideration, nothing patentable is
found in the claims over the references of record and (both)
of the claims are finally rejected upon the references and for
the reasons of record.

*Confidential
Smith*

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
PROCESS OF MAKING PHONOGRAPH)
RECORDS.) Room No. 379
Filed March 18, 1908,)
Serial No. 421,887.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

I hereby appeal to the Examiners -in-Chief from the decision of the principal Examiner in the matter of my application for Letters Patent for a PROCESS OF MAKING PHONOGRAPH RECORDS, filed March 18, 1908, Serial No. 421,887, which on the twenty-third day of April, 1910, was finally rejected. The following are the points of the decision upon which the appeal is taken:

1. The Examiner erred in rejecting the claims.
2. The Examiner erred in holding the claims to be without patentable novelty.

An oral hearing is requested.

Very respectfully,

THOMAS A. EDISON,

By Frank L. Dyer

His Attorney.

Orange, New Jersey,

April 14th 1911.

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
PROCESS OF MAKING)
PHONOGRAPH RECORDS,) Room No. 379.
Filed March 18, 1908,)
Serial No. 421,887.)

HONORABLE COMMISSIONER OF PATENTS;

S I R:

In response to the final rejection of April 23, 1910, an appeal from the decision of the Examiner to the Board of Examiners-in-Chief has been filed on even date herewith.

It is herein desired to respond to the second paragraph of the last Office action in which it was held that claim 1 is objectionable because "drying" and "rotating" the mould are included as separate steps in the process. By reference to line 9, page 3, it will be seen that the rotation of the mould is independent of the drying and that these two steps are therefore properly included in claim 1 independently of each other. There is no rotation of the mould during the drying referred to.

It is accordingly requested that the objection referred to be withdrawn.

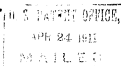
Very respectfully,

Orange, New Jersey,
April 14th 1911.

THOMAS A. EDISON,

By Frank L. Dyer
His Attorney.

IN THE UNITED STATES PATENT OFFICE



Application of,)
 Thomas A. Edison, for) Before the Hon. Board of
 Process of Making Phonograph) Examiners-in-Chief.
 Records,)
 Filed March 18, 1908, #421,887,)
 Atty: Frank L. Dyer .)

Examiner's Statement .

This is an appeal from the Examiner's final rejection of the following claims :

1. A process of making a phonograph record which consists in providing a mold carrying a negative impression of the record, applying to said mold a film of material adapted to harden the surface of the record, drying the mold, rotating the mold, introducing therein a wax-like composition in molten condition, and molding the same by centrifugal action in intimate contact with the hardened surface film, cooling the record so made, and withdrawing from the mold the finished record of wax-like composition having a hardened surface film intimately welded thereto, substantially as set forth.

2. The process of making a phonograph record, which consists in providing a mold carrying a negative impression of the record, coating the mold with a layer of collodion solution, molding a record therein from wax-like composition, thereby causing collodion to be intimately welded to the wax-like composition at its surface, allowing the record so formed to contract and withdrawing it longitudinally from the mold, substantially as set forth .

The references relied upon are:

Petit, #589,408, Dec. 24, 1901, (181-16);

Aylsworth, #885,605, June 4, 1907, same class;

Aylsworth, #782,375, Feb. 14, 1905, (181-17).

Petit shows the broad equivalent of applicant's method. In the Petit method the thin film 8 is first coated over the mold a, allowed to cool and then the body of the record 9 is placed within the film and steam forced in which softens the body portion 9 of the record and forces it against the film 8 .

The present applicant instead of adopting the Petit

#421,687-----2.

method of placing the body portion 9 within the film and mold and forcing the body portion of the record against the film, has followed the Aylsworth process referred to by the applicant in his specification and disclosed in the Aylsworth patent . After having coated the mold with the film as in the Petit disclosure, applicant forces the body part of the record against ^{the film in} the way disclosed in Aylsworth, 855,605. This change from the Petit to the Aylsworth method of forcing the body portion into contact with the film, is not thought to involve invention.

In claim 1, applicant states as one step of his process, ^{the} "drying mold" . What he probably means is that he dries the film on the mold, and this claim has been construed accordingly. So far as the "wax like composition" is concerned of which the body portion is composed, the patent to Aylsworth, #782,375, referred to in his patent, #855,605, shows that the materials that he was working with are all "wax like composition". The method, therefore set forth in the appealed claims, appears to be only an aggregation of steps and even of the composition used disclosed in the Petit and Aylsworth patents.

Respectfully submitted:

Examiner, Division XXIII .

April 24, 1911 .

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

385
April 26 1911.
Sir:

The case of *Thomas A. Edison*

Serial } No. *42,507*, will be heard by the ~~Commissioner~~
~~Interf.~~ } Examiners-in-Chief
on the *14th* day of *September* 1911.

It is the *third* case on the assignment for that day.

The hearings will commence at ~~ten~~ ^{one} o'clock, and as soon as
the argument in one case is concluded the succeeding case will
be taken up.

If any party, or his attorney, shall not appear when the
case is called, his right to an oral hearing will be regarded
as waived.

The time allowed for arguments is as follows:

Ex parte cases, thirty minutes;
Motions, thirty minutes, each side;
Interference appeals, final hearing, one hour each side.

By special leave, obtained before the argument is commenced,
the time may be extended.

The appellant shall have the right to open and conclude in
interference cases, and in such case a full and fair opening
must be made.

Briefs in interference appeals must be filed in accordance
with the provisions of Rule 147.

Respectfully,

E. M. Moon.
Commissioner of Patents.

To *Frank S. Dyer*
Adams
M. J.
To _____

IN THE UNITED STATES PATENT OFFICE

Application of)
:)
Thomas A. Edison for)
: Before the Honorable Board
PROCESS OF MAKING PHONO-) of Examiners-in-Chief
GRAPH RECORDS)
:)
Filed March 18, 1908)
:)
Serial No. 421,887)

APPELLANT'S BRIEF

This is an appeal from the Examiner's final
rejection of the following claims:-

1. A process of making a phonograph record which consists in providing a mold carrying a negative impression of the record, applying to said mold a film of material adapted to harden the surface of the record, drying the mold, rotating the mold, introducing therein a wax-like composition in molten condition, and molding the same by centrifugal action in intimate contact with the hardened surface film, cooling the record so made, and withdrawing from the mold the finished record of wax-like composition having a hardened surface film intimately welded thereto, substantially as set forth.

2. The process of making a phonograph record, which consists in providing a mold carrying a negative impression of the record, coating the mold with a layer of collodion solution, molding a record therein from wax-like composition, thereby causing collodion to be intimately welded to the wax-like composition at its surface, allowing the record so formed to contract and withdrawing it longitudinally from the mold, substantially as set forth.

The applicant's invention relates to processes of making phonograph records, and more particularly to processes for making a record of wax-like material having a hardened surface coating thereon. Wax-like compositions now in common use for making phonograph records, such, for

example, as those described in patent No. 782,375, granted to Jonas W. Aylsworth, can be readily molded, give an accurate copy of the surface of the mold or matrix, and after being molded, can be reamed out and trimmed off and otherwise worked with great facility. Records can furthermore be made from these materials at a low cost, with simple machinery, and by very cheap labor. Records, however, made from these wax-like compositions show signs of wear after being submitted to a large number of reproductions, so that the character of the reproduction obtained therefrom deteriorates. It is desirable, therefore, that a record be made which will have a harder and tougher wearing surface, and which will at the same time retain the good moldable and workable qualities of the records made from the wax-like compositions now used.

The applicant has disclosed and claimed in applications Serial Nos. 421,884 and 421,886, records having these characteristics, and claims in the present application an effective process by which such records may be manufactured.

In accordance with this process, a coating of hard and tough material is applied to the negative record surface of a mold. A suitable material for this purpose, according to the specification, is collodion or nitrated cellulose dissolved in a suitable solvent such as amyl acetate. After this material has been applied to the inner or record surface of the mold, as by immersing the latter in a solution of the said material, the coated mold is allowed to dry, after which a record is molded therein

of the wax-like composition mentioned above. This wax-like composition may be molded to the surface film in numerous ways, Claim 1 specifying a process employing centrifugal force produced in a rotating mold into which the wax-like composition is introduced in a molten condition. A process for molding a complete record in this manner is disclosed in the patent to Jonas W. Aylsworth, No. 855,605, dated June 4, 1907. After the cooling of the wax-like composition in contact with the surface coating, the record may be withdrawn from the mold with the surface film intimately welded thereto.

The references relied upon by the Examiner are:-

Petit, No. 689,408, December 24, 1901;

Aylsworth, No. 855,605, June 4, 1907;

Aylsworth, No. 782,375, February 14, 1905.

In the Petit method a film g is first coated upon the mold a and allowed to set or dry, whereupon the "foundation g or cylindrical shell" is placed within the film, the film and foundation being subsequently softened and cemented together by forcing steam into the mold. Aylsworth patent No. 855,605 merely discloses the process of making duplicate records which consists in rotating a hot mold at a high speed and introducing molten material therein, so that the material will be compressed by centrifugal force against the record surface and be uniformly distributed over the same, and upon cooling, a homogeneous duplicate record will be formed. Aylsworth patent No. 782,375 discloses a wax-like composition for making duplicate phonograph records.

The Examiner takes the position that "The method * * * set forth in the appealed claims, appears to be only an aggregation of steps and even of the composition used disclosed in the Petit and Aylsworth patents." In explanation of his position the Examiner states: "The present applicant instead of adopting the Petit method of placing the body portion 9 within the film and mold and forcing the body portion of the record against the film, has followed the Aylsworth process referred to by the applicant in his specification and disclosed in the Aylsworth patent. * * * * * This change from the Petit to the Aylsworth method of forcing the body portion into contact with the film is not thought to involve invention."

It is submitted that the Petit and Aylsworth patents do not anticipate the applicant's claims for the following reasons:-

First: The patent to Aylsworth does not disclose a process for forcing the body portion of a record in contact with a surface film therefor, and surely there is no suggestion of the welding of a protective coating to a wax-like record, as called for by the applicant's claims. In order to reject the claims the Examiner finds it necessary to substitute the simple centrifugal molding process indicated by Aylsworth for the Petit method of welding a "foundation" to a surface veneer. As the Aylsworth patent does not contemplate this welding feature, the Examiner's position seems to be untenable.

Second: Claim 1 calls for "applying to said mold a film of material adapted to harden the surface of the record", and Claim 2, "molding a record" in a mold coated with a layer of collodion solution. The object of the applicant's invention is to produce a record which will have a hard and tough wearing surface and which will at the same time retain the good moldable and workable qualities of the records made from the wax-like compositions now used. What the claims call for, then, is not the formation of a composite record of the type disclosed by Petit, but the provision of a wax-like record having a record impression therein and provided with a thin film or protecting coating. Although Figure 3 of the Petit patent of record discloses a surface veneer which has an irregular backing, a more inspection of this figure will indicate that the irregularities in the backing of the said veneer are not exact counterparts of the record impressions; and there is nothing in the Petit specification to indicate that such a structure was contemplated. Neither of the Aylsworth patents discloses a record of the type which it is the applicant's object to produce.

Third: None of the patents of record discloses the combination of coating and the record materials called for by the claims. By reason of the good molding qualities of the wax-like compositions and of the superior wearing qualities of other tougher and harder materials, it is desirable to form a record of the former materials provided with a wearing surface of the latter materials. Neither the Petit nor the Aylsworth patents point out how this can be done.

Evidently, Petit did not consider his process suited for use with different compositions for the surface veneer and the foundation, for in lines 14 to 28 on page 2 of his specification he states as follows:-

"The foundation is preferably made of material adapted to be softened and connected by heat and pressure through adhesion to the duplicate sound record film, and the material of the foundation is preferably of such a nature as to carry a substance of a similar nature to that composing the film, either by being impregnated with, or by having an applied surface coating of, such material, so that the connection formed between the two by heat and pressure may be a cementing action. The material of the foundation may be and preferably is the same as that of the film, but loaded with pigment to give body and cheapness."

It is furthermore pointed out that as the material of Petit's foundation is merely rendered plastic and is not melted or fused, the pressing of the same against a thin surface film such as that contemplated by the applicant would be apt to tear or otherwise injure the said film. Neither of the Aylsworth patents or record discloses a record having superposed layers of different materials.

The processes outlined by the applicant in which the material of the record is molded and welded to the surface coating by introducing the said material into the mold in a molten condition have rendered possible the solution of the hitherto unsolved problem of providing a wax-like record with a hardened surface coating. This process is designed for an object different from any contemplated in the patents of record, and is not disclosed nor suggested by these patents taken either singly or collectively. The

Honorable Board of Examiners-in-Chief are accordingly, in view of the foregoing remarks, respectfully requested to adjudge the claims in issue patentable in their decision on this appeal.

Respectfully submitted,

THOMAS A. RUISON

By _____

His Attorney

Orango, New Jersey
August 19, 1911.

2-202

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

375

Thomas A. Edison,
c/o Frank L. Dyer, Atty.,
Orange,
N. J.



Sir:

Inclosed find copy of decision this day rendered by the

Examiners in Chief in the { ex parte } case of
~~XXXXXXXXXX~~

Thomas A. Edison, Serial No. 421,887.

By direction of the Commissioner:

Very respectfully,

W. F. Woolard,

Chief Clerk.

J.R.S.

Appeal No. 4224. U. S. PATENT OFFICE. October 6, 1911.

Before the Examiners-in-Chief, on Appeal.

Application of Thomas A. Edison for a patent for an improvement in Process of Making Phonograph Records, filed March 18, 1908, Serial No. 421,887.

Mr. Frank L. Dyer, attorney for appellant.

The applicant has appealed from the action of the primary examiner finally rejecting the following claims:-

1. A process of making a phonograph record which consists in providing a mold carrying a negative impression of the record, applying to said mold a film of material adapted to harden the surface of the record, drying the mold, rotating the mold, introducing therein a wax-like composition in molten condition, and molding the same by centrifugal action in intimate contact with the hardened surface film, cooling the record so made, and withdrawing from the mold the finished record of wax-like composition having a hardened surface film intimately welded thereto, substantially as set forth.

2. The process of making a phonograph record, which consists in providing a mold carrying a negative impression of the record, coating the mold with a layer of collodion solution, molding a record therein from wax-like composition, thereby causing collodion to be intimately welded to the wax-like composition at its surface, allowing the record so formed to contract and withdrawing it longitudinally from the mold, substantially as set forth.

The references cited are:-

Petit,	689,408,	December 24, 1901,
Aylsworth,	855,605,	June 4, 1907,
Aylsworth,	782,375,	February 14, 1905.

We find no error in the action of the primary examiner rejecting the appealed claims upon the patent to Petit, taken in connection with the Aylsworth patents. Petit discloses a process of making phonograph records which consists in applying a film of

material to a mold carrying a negative impression of the record, which film of material is adapted to harden the surface of the record, allowing the film to dry and introducing therein a substance to form the base of the record and pressing and molding the substance of the base, when softened by heat, into intimate contact with the hardened surface film. We find in this process of Petit substantially the same process that is defined in claim 1.

Petit does not mention any rotation of the mold in the application of the substance of the base to the surface film. He does suggest, however, the application of the surface film to the mold by centrifugal action. We fail to perceive that the adoption by the applicant of this well known method of flowing one substance over an inside surface in applying his wax-like composition to his surface film involved invention. Claim 1 limits the substance with which the surface film of the record is backed to a wax-like composition. Petit does not state the composition of the backing of his record, but he does state that it is softened by heat and forms an intimate contact by adhesion with the surface film upon being pressed into contact therewith while in softened condition. To this extent the Petit backing is wax-like. To substitute in the Petit process the use of an entirely wax-like composition for the corresponding substance used by Petit would not involve invention, in view of the common use of wax-like compositions in the manufacture of records for phonographs, of which Aylsworth, #782,375, furnishes an example.

The process set forth in claim 2 is also substantially that of Petit, so far as the question of invention is concerned. This claim is not limited to the use of centrifugal action. It is limited to a colloidal solution as the substance of which the coating of the mold and the surface of the record is formed. Petit, however, suggests the use of collodion for this purpose.

The applicant, in his argument, makes reference to the pro-

#4224---3.

duction of a groove in the wax backing corresponding to the record groove. Neither of the claims is limited to this feature. Each of them would be infringed, so far as this feature is concerned, by the Petit process, in which this feature does not appear to be present. Moreover, if the claims were so limited they would not be allowable because this feature does not appear to be of consequence, so far as the process of making the record is concerned. The importance of this feature seems to lie in its relation to the saving of surface material, but this is a result which pertains to the article rather than to the process of making the same.

The action of the primary examiner finally rejecting the appealed claims is affirmed.

Fairfax Bayard,

T. G. Steward,

Frank C. Skinner,

Examiners-in-Chief.

Put in \$ 285.

U 116 025

Sept. 3, 1912.

Mr. Dyer:

Policies 385, 386 and 388.

All of the claims in the above applications have been rejected by the Patent Office and the rejections sustained by the Board of Examiners-in-Chief. Mr. Edison has stated that the said applications are ~~of~~ ^{of} not importance to us. I think there is no chance of securing the rejected claims by further appeal. Please advise me whether or not to drop the applications in question.

FB-KGK

Backmann
Arch
Frederick Backmann
Hyp

Folio No. 386

Serial No. 421884
386

Applicant.

Thomas A. Edison

Address.

Linden Park

Orange, N. J.

Title Photograph Records (Case A.)

Filed March 18, 1908 Examiner's Room No. 379.

Assignee.

Ass't Exec. Recorded Liber. Page.

Patent No. Issued

ACTIONS.

- 1 Rejected April 2, 1908. 16
- 2 Amended March 25, 1909. 17
- 3 Rejected April 14, 1909. 18
- 4 Amended April 7, 1910. 19
- 5 Finally rejected April 23, 1910. 20
- 6 Appeal to Examiners in Chief 4/11/11. 21
- 7 Examiners' statement Apr. 21, 1911. 22
- 8 Brief for Appellant Aug. 19, 1911. 23
- 9 Decision Examiners in Chief 10/6/11. 24
- 10 25
- 11 26
- 12 27
- 13 28
- 14 29
- 15 30

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

1. 386

Q

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, County of Essex and State of New Jersey,

prays that letters patent may be granted to him for the improvements in
PHONOGRAPH RECORDS (Case A)

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Orange, New Jersey, his attorney, with full
power of substitution and revocation, to prosecute this application, to make
alterations and amendments therein, to receive the patent, and to transact all
business in the Patent Office connected therewith.

Thomas A. Edison

- SPECIFICATION -

TO ALL WHOM IT MAY CONCERN;

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, County of Essex and State of New Jersey, have invented certain new and useful improvements in PHONOGRAPH RECORDS, of which the following is a description:-

The wax-like compositions now in common use for making phonograph records, such, for example, as those described in patent No. 782,375, granted to Jonas W. Aylsworth, have qualities which make them specially well adapted for this purpose. Such materials can be readily molded, give an accurate copy of the surface of the mold or matrix, and after being molded can be reamed out and trimmed off and otherwise worked with great facility. Phonograph records can be made from these materials at low cost, with simple machinery and by very cheap labor. It is a fact, however, that records made from these wax-like compositions and made as is now the common practice, with substantially one hundred record grooves to the inch, after being subjected to a large number of reproductions in the phonograph, show signs of wear, and the character of the reproduction obtained therefrom deteriorates. Obviously, such records will be more rapidly worn when a narrower record groove and a reproducing stylus of correspondingly decreased size are made use of. It is desirable, therefore, that a record be made which will have a harder and tougher wearing surface and which will at the same time retain the

good moldable and workable qualities of the records made from the wax-like compositions now used.

The object of the present invention is to provide a record of the sort just described made from wax or wax-like composition and having a hardened wearing surface. The material which I use for imparting a hardened wearing surface to the record is a mixture of nitrated cellulose and shellac, dissolved in a suitable solvent, such, for example, as amyl acetate. This mixture is specially adapted for this purpose, since the collodion solution of cellulose is adapted to impart very great toughness, while the shellac greatly increases the hardness of the surface film.

In the practice of my invention, I may immerse a phonograph record, either an original or duplicate, which has been made in any of the usual ways, from the usual wax-like compositions, in a solution of nitrated cellulose and shellac, dissolved in amyl acetate, or other equivalent solvent, and after immersing the record in this solution I withdraw it therefrom, leaving a thin film of the solution adhering to its surface. I then dry this film upon the record. While it is drying, I prefer to rotate it slowly upon a vertical mandrel, the mandrel being placed in this position so that the film of collodion and shellac will not tend to collect at one side of the record. After the film, which is extremely thin, so that it will not interfere with or obstruct the undulations of the record groove, has been dried, I place it in a heated chamber and rotate it slowly, leaving it in this chamber until the wax-like material of the record has become somewhat softened, but not sufficiently so to result in the malformation or distortion of the record groove. The effect of this treatment is to weld the film to the record so that when cooled it will have a

surface of much greater hardness and toughness than the wax record previously had, and the reproducing stylus will not tear or detach the film from the wax-like material of the record. The thickness of the film may be governed by regulating the strength of the solution, a very dilute solution producing a thin film, as will be understood, and a stronger solution a thicker film. The film must not be thick enough to interfere with the volume of sound produced by the record.

Instead of first forming the record and then producing a hard and tough surface film thereon, as above described, the film may be first formed and the record be then molded or otherwise produced, in which case the process will be carried into effect as follows:- I take first the ordinary mold or matrix which has been made in metal from a master record and which is used for molding duplicates, and apply a coating of the solution named above to the negative record surface of this mold or matrix. I preferably apply this material to the mold by immersing the latter in the solution of nitrated cellulose and shellac in amyl acetate or an equivalent solvent. And after the mold is withdrawn from the solution, I preferably allow it to dry in a vertical position so that there will be no tendency for the solution to gather at one side of the mold and so produce an unduly thick film at that side. After it has been dried, so that substantially all of the volatile solvent used in making the solution has been eliminated, I make use of the mold for molding a record therein, using for this purpose any of the materials well-known in the art, but preferably the wax-like composition now commonly used for this purpose. The thickness of the film so produced

upon the mold and thereafter transferred to the exterior of the wax-like record, may be controlled by varying the strength of the solution, or by repeatedly dipping the mold in the solution and drying it after each such dipping, as will be understood. When the record of wax-like material is molded within the mold, to which the surface hardening film has thus been applied, the film will become intimately welded to the wax-like composition, and when the latter shrinks away from the mold, this surface hardened film will be carried away from the mold by the wax-like composition to which it is welded. The molding may be done in any well-known fashion, either by dipping the mold into the moldable material and allowing it to congeal on the inner surface of the mold, and then withdrawing the mold with its coating before the mold itself has had time to become heated, as disclosed in Patent No. 683,615, granted to Miller and Aylsworth, on October 1, 1901, or, I may mold the material by pouring, for example, as disclosed in the patent to Maurice Joyce, No. 831,668, dated September 25, 1906, or, I may make use of centrifugal force for molding the material, the mold being rapidly rotated during the formation of the record, as disclosed in patent to Jonas A. Aylsworth, No. 855,605 dated June 4, 1907, or, I may make use of other ways known in the art for molding the material. In any case, however, the molding is done, when the material is placed in the mold and allowed to cool therein, the film of collodion which was placed upon the negative record surface of the mold before the wax-like or other moldable material was introduced therein, will become firmly and intimately welded to the outer surface of such material in such a way that when the record is used for reproduction, the reproducing stylus will not detach the surface hardening film.

It is evident that the record groove and the undulations thereof, in a record produced in this manner, will be entirely unaffected by the presence of the hardened surface of collodion and shellac since the complete record groove will be accurately molded within the hardened surface film. By this process I am enabled to make use of the surface hardening and toughening film of any desired thickness and in no manner detract from the reproducing qualities of the record while I add very greatly to its life and wearing qualities.

Having now described my invention, what I claim is:-

1. A phonograph record of wax-like composition, having a hardened and toughened surface ^{and fused with the surface} of collodion and shellac, substantially as set forth.

2. A phonograph record of moldable wax-like material, having on its surface a film of collodion and shellac intimately welded thereto, substantially as set forth.

Inventor "A" Claim 1 Apr 7, 1910.

This specification signed and witnessed this 13 day of March 1908

Thomas A. Edison

Witnesses:

1. Frank L. Dyer

2. Anna R. Klehm

Oath.

State of New Jersey } ss.,
County of Essex

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Orange, County of Essex and State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the improvements in PHONOGRAPH RECORDS,

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Thomas A. Edison

Sworn to and subscribed before me this 13 day of March 1908

H. H. Dyer

[Seal]

Notary Public.

2-200.

386

DIV. 25-- Room.....379
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

J. H. E. - L1.

Paper No. 1, Reg.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

April 2, 1908.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.

APR 2 1908

MAILED

Please find below a communication from the EXAMINER in charge of your application,

for Phonograph Records, filed March 18, 1908, serial number 421,884.

E. B. Moore

Commissioner of Patents.

The claims are rejected in view of the patents of,

Petit, Dec. 24, 1901, #689,408, (181-16);

Harris, Dec. 11, 1906, #837,927, (181-17);

Adams-Randals Eng. Patent, #1058 of 1889, (181-2), and

Emerson, Dec. 18, 1906, #838,968, (181-11).

Applicant is requested to file a drawing of a record tablet
having inscribed thereon the names of the elements constituting the
same.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)
)
PHONOGRAPH RECORDS)
)
Filed March 18, 1908)
)
Serial No. 421,884)

Room No. 379

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to Office action of
April 2, 1908, please amend the above entitled case as
follows:

Claim 1, line 2, after "surface" insert - com-
posed - . Same line, after "or" insert - a mixture of - .

R E M A R K S

Applicant will file a drawing of a record
tablet having inscribed thereon the names of the elements
constituting the same, before the case goes to issue.

Reconsideration and allowance of the claims
are requested. None of the references discloses a record
of wax-like or moldable material having a film of collod-
ion and shellac welded to the surface thereof. The near-
est reference would seem to be Emerson, who discloses a
record formed entirely of a composition of celluloid in
which the shellac is mixed. This is, however, an entirely
different thing from the invention claimed by applicant.
The disclosure of Adams-Randall is also quite different.
In his process a backing as of paper is covered with wax,

collodion or the like, on which is superimposed a layer of powdered plumbago, which, after the record is made, is either covered with a layer of metallic varnish or electrolytically deposited copper. In applicant's case, the collodion and shellac forming the tough surface, are thoroughly admixed to form a unitary composition.

Respectfully submitted.

THOMAS A. EDISON

By

Frank L. Dyer

His Attorney

Orange, New Jersey

March 25, 1909

386

B-260.

Div. 23 Room 379
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

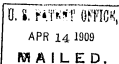
Paper No. 1-10-1
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

J. H. D. - Li.

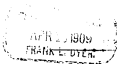
DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

April 14, 1909.

Thomas A. Edison,
Care Frank J. Dyer,
Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application,
for Phonograph Records, filed March 18, 1908, serial number 421,884.



E. B. Moore

Commissioner of Patents.

This action is in response to the amendment filed the
27th ultimo.

In the patent of Adams-Randall, cited, it is shown to
be old to provide a record in soft material with a harder
protective coating. It must be held by the examiner that it is
merely an uninvended change over Adams-Randall to provide a
commonly known wax-like record with such coating of a material
well known as a hard record surface material and the claims must
be rejected accordingly.

James

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison :
PHONOGRAPH RECORDS : Room No. 379.
Filed March 18, 1908 :
Serial No. 421,884 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of April
14, 1909, please amend this case as follows:

✓ Cancel the Claims and substitute the following:

2
/ A phonograph record of moldable wax-like composition having the record groove on the surface thereof and having a hardened and toughened surface layer or film thereon composed of a mixture of collodion and shellac intimately welded thereto, substantially as described.

R E M A R K S

Reconsideration and allowance of this application as amended are respectfully requested. The claims have been canceled and a new one substituted therefor which is thought to distinguish sufficiently from all the references. In Adams-Randall, the surface layer is not welded to the wax composition, a layer of graphite being interposed between the wax and the base. Neither is the

specific surfacing material, namely, a mixture of collodion and shellac, disclosed in this reference or in any other. It is thought that applicant is the first to place a protective coating on a wax surface in intimate engagement therewith.

Respectfully submitted,

THOMAS A. EDISON

By

Frank L. Dyer

Attorney.

Orange, N. J.

April 7th, 1910.

386

2-200.

Div. 23 Room 379
ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

Paper No. 574, No. 1.
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

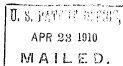
J. H. D.-S.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

April 23, 1910.

Thomas A. Edison,
Care Frank J. Dyer,
Orange, New Jersey.

Care Edison Laboratory.



Please find below a communication from the EXAMINER in charge of your application,

for Phonograph Records, filed March 18, 1908, serial number 421,884.

E. B. Moore

Commissioner of Patents.

This action is responsive to the amendment filed April
8, 1910.

After a careful consideration nothing patentable is
found in the claim over the references of record and the claim is
finally rejected upon the references and for the reasons of record.

*careful
consideration*

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
PHONOGRAPH RECORDS,) Room No. 379.
Filed March 18, 1908,)
Serial No. 421,884.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

I hereby appeal to the Examiners-in-Chief from the decision of the principal Examiner in the matter of my application for Letters Patent for PHONOGRAPH RECORDS, filed March 18, 1908, Serial No. 421,884, which on the twenty-third day of April, 1910, was finally rejected. The following are the points of the decision upon which the appeal is taken:

1. The Examiner erred in rejecting the claims.
2. The Examiner erred in holding the claims to be without patentable novelty.

An oral hearing is requested.

Very respectfully,

THOMAS A. EDISON,

Orange, New Jersey,
April 14th 1911.

By Frank L. Dyer
His Attorney.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

April 26 1911

Sir:

The case of *Thomas A. Edison*

386
Serial ~~1472~~ } No. *421,884*, will be heard by the ~~Commissioner~~
~~Examiners-in-Chief~~ on the *14th* day of *September*, 1911.

It is the ~~first~~ case on the assignment for that day.

The hearings will commence at ~~ten~~ *one* o'clock, and as soon as the argument in one case is concluded the succeeding case will be taken up.

If any party, or his attorney, shall not appear when the case is called, his right to an oral hearing will be regarded as waived.

The time allowed for arguments is as follows:

Ex parte cases, thirty minutes;
Motions, thirty minutes, each side;
Interference appeals, final hearing, one hour each side.

By special leave, obtained before the argument is commenced, the time may be extended.

The appellant shall have the right to open and conclude in interference cases, and in such case a full and fair opening must be made.

Briefs in interference appeals must be filed in accordance with the provisions of Rule 147.

Respectfully,

E. M. Moon.
Commissioner of Patents.

To *Frank S. Jager - Atty.*

Orange, N.J.
W. J.

To _____

IN THE UNITED STATES PATENT OFFICE.

Application of)
Thomas A. Edison, for) before the Hon. Board of
Phonograph Records,) Examiners-in-Chief.
Filed March 18, 1908,)
Ser. # 421,884,)
Atty: Frank L. Dyer .)

Examiner's Statement .

This is an appeal from the Examiner's final rejection of the following claim :

1. A phonograph record of moldable wax-like composition having the record groove on the surface thereof and having a hardened and toughened surface layer or film thereon composed of a mixture of collodion and shellac intimately welded thereto, substantially as described .

The references relied upon are:

Petit, #689,408, Dec. 24, 1901, (181-16);
Aylsworth, #855,605, June 4, 1907, same class, and
Aylsworth, #782,375, Feb. 14, 1905, (181-17).

Probably Petit alone anticipates the claim, except for the material of the body portion or foundation of the record. Petit discloses in Figure 1 a phonograph record having a body or foundation 9 covered with a thin film of toughened or hardened material 8. petit states on page 1, line 28, that this film is made of celluloid, gelatine, lac, collodion, etc. (lac and shellac are the same). It is true that the present applicant states that the collodion and shellac are mixed but if it is old as shown in Petit to use collodion and also to use lac or shellac, it is not believed to involve invention to use a mixture of the two out of which to make the film of toughened material.

The patents to Aylsworth show it to be old to make the record of wax-like composition.

Respectfully submitted:

Examiner, Division XXIII .

April 24, 1911 .

IN THE UNITED STATES PATENT OFFICE

Application of)	
Thomas A. Edison for	:	
)	
PHONOGRAPH RECORDS	:	Before the Honorable Board
	)	of Examiners-in-Chief
Filed March 18, 1908	:	
)	
Serial No. 421,884	:	

APPELLANT'S BRIEF

This is an appeal from the Examiner's final rejection of the following claim:-

A phonograph record of moldable wax-like composition having the record groove on the surface thereof and having a hardened and toughened surface layer or film thereon composed of a mixture of collodion and shellac intimately welded thereto, substantially as described.

The applicant's invention relates to phonograph records, and more particularly to a record of readily moldable material which has a tough wearing surface adapted to be subjected to a large number of reproductions without sensible wear. Wax-like compositions now in common use for making phonograph records, such, for example, as those described in patent No. 782,375, granted to Jonas W. Aylsworth, can be readily molded, give an accurate copy of the surface of the mold or matrix, and after being molded, can be reamed out and trimmed off, or otherwise worked with great facility. Phonograph records can furthermore be made of these materials at low cost, with simple machinery, and by very cheap labor. Records made from these wax-like

compositions, however, after being subjected to a large number of reproductions on a phonograph, show signs of wear and the character of the reproductions obtained therefrom deteriorates. It is desirable, therefore, that a record be made which will have a harder and tougher wearing surface, and which will at the same time retain the good moldable and workable qualities of the records made from the wax-like composition.

The applicant's invention consists in the provision of a record of moldable wax-like composition having the record groove on the surface thereof and having thereon a hardened and toughened surface layer or film composed of a mixture of collodion and shellac intimately welded to the wax-like composition.

In order to indicate how this surface film can be applied to the record, the applicant suggests several processes. According to the first mentioned process, a phonograph record which has been made in any of the usual ways from the usual wax-like compositions, is immersed in a solution of collodion and shellac dissolved in a suitable solvent, such as amyl acetate, so that upon withdrawing the record from the solution, a thin film of the solution adheres to the same. This film is then dried upon the record, the latter being subsequently placed in a heated chamber, where it is left until the wax-like material of the record has become somewhat softened, but not sufficiently so to result in the malformation or distortion of the record groove. This treatment welds the film to the record, so that when cold it will have a film of such hard-

ness that the reproducing stylus will not tear or detach the same from the wax-like material of the record.

The applicant also suggests that instead of first forming the record and then producing a hard and tough surface film thereon, the film may be formed first, and the record then molded or otherwise produced in the following manner:- A coating of the solution of the record composition is applied to the mold as by dipping the latter into the solution, and after withdrawal from the solution, allowing it to dry. A record is then molded in the coated mold from any of the well known wax-like compositions. The film becomes firmly welded to the wax-like composition during the molding, so that when the record shrinks from the mold, the hardened surface film will be carried from the mold with the wax-like composition to which it is welded.

The claim is rejected upon the following patents:-

Petit, No. 689,408, December 24, 1901;

Aylsworth, No. 782,375, February 14, 1905;

Aylsworth, No. 855,605, June 4, 1907.

The Examiner explains the rejection by stating that Petit discloses a phonograph record having a body portion or foundation covered with a thin film of toughened or hardened material, the materials comprising the mixture employed by the applicant for the surface film being mentioned by Petit individually, but not as a mixture, and the wax-like composition for the record being disclosed by Aylsworth.

The Examiner seems to have lost sight of one of the principal features of the invention, namely, that the record

groove is formed on the surface of the moldable wax-like composition. This feature is not disclosed in any of the references of record. The patent to Petit, which appears to be the principal reference relied upon by the Examiner discloses in Figure 3 a surface film which has a somewhat irregular interior surface, but a mere inspection of this figure indicates that the inner surface of the film does not contain an accurate copy of the record impression. Petit's intention was evidently to build up a composite record having a record bearing surface veneer, and a foundation (not a record) of a similar material, whereas the applicant's object was to apply to the surface of a complete wax-like record a suitable harder and tougher protective coating. That Petit did not have in mind the applicant's invention is indicated by his reference to the inner portion of his record as a "foundation" or "cylindrical shell",/ (not a record). (See line 5, page 2) Neither of the patents to Aylsworth discloses this feature of the applicant's invention.

The Examiner furthermore takes the ground that as long as the various materials of the compositions specified in the claim for the surface layer and record have been separately referred to as suitable for making phonograph records, their combination in the manner set forth in the claim in issue does not involve invention. In the first place, it is pointed out that neither the patent to Petit nor any of the other patents of record discloses a "mixture of collodion and shellac" for the surface layer of the record, Petit merely mentioning the use of these

materials separately. In reference to the materials employed by the applicant, it is submitted that even if these various materials are separately old, there is invention in combining them as set forth in the claim. By reason of the good molding qualities of the wax-like compositions and of the superior wearing qualities of the mixture of collodion and shellac called for by the claim in issue, it is desirable to form a record of the former materials provided with a wearing surface of the latter materials. Neither the Petit nor the Aylsworth patents point out how this can be done. In lines 14 to 18, page 2 of his patent of record, Petit states as follows:-

"The foundation is preferably made of material adapted to be softened and connected by heat and pressure through adhesion to the duplicate sound record film, and the material of the foundation is preferably of such a nature as to carry a substance of similar nature to that composing the film, either by being impregnated with, or by having an applied surface coating of, such material, so that the connection formed between the two by heat and pressure may be a cementing action. The material of the foundation may be and preferably is the same as that of the film, but loaded with pigment to give body and cheapness."

In view of this statement, Petit's process is evidently not designed for use in connection with different materials such as those specified in the claim in issue. The Aylsworth patents also offer no suggestion how the wax-like materials mentioned therein can be welded to applicant's specific surface composition.

It is furthermore pointed out that as the material of Petit's foundation is merely rendered plastic and

is not melted or fused, the pressing of the same against a thin surface film such as that contemplated by the applicant would be apt to tear or otherwise injure the said film. By the applicant's processes as outlined in the specification, this objection is obviated, and the secure welding together of the wax-like record and its surface coating is rendered possible.

The applicant, therefore, by new processes, has produced an article not disclosed in the prior art and one which evidently could not be produced by the processes heretofore known; and the Honorable Board of Examiners-in-Chief are accordingly, in view of the foregoing remarks, respectfully requested to adjudge the claim in issue patentable in their decision on this appeal.

Respectfully submitted,

THOMAS A. EDISON

By

W. H. Rogers

His Attorney

Orange, New Jersey

August 19, 1911.

2-202

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

386

Thomas A. Edison,

c/o Frank L. Dyer, Atty.,

Orange,

N. J.



Sir:

Inclosed find copy of decision this day rendered by the

Examiners in Chief in the { ex parte } case of
 { interference }

Thomas A. Edison, Serial No. 421,884.

By direction of the Commissioner:

Very respectfully,

W. F. Woolard,

Chief Clerk.

J.R.S.

Appeal No. 4322.

U. S. PATENT OFFICE.

October 6, 1911.

Before the Examiners-in-Chief, on Appeal.

Application of Thomas A. Edison for a patent for an improvement in Phonograph Records, filed March 18, 1908, Serial No. 421,884.

Mr. Frank L. Dyer, attorney for appellant.

The applicant has appealed from the action of the primary examiner finally rejecting the following claim:-

"A phonograph record of moldable wax-like composition having the record groove on the surface thereof and having a hardened and toughened surface layer or film thereon composed of a mixture of collodion and shellac intimately welded thereto, substantially as described."

The references cited are:-

Petit,	689,408,	December 24, 1901,
Aylsworth,	855,605,	June 4, 1907,
Aylsworth,	782,375,	February 14, 1905.

We find no error in the action of the primary examiner finally rejecting the appealed claim upon the patent to Petit, taken in connection with the Aylsworth patents. The grounds of our position are in the main those set forth in our decisions of even date herewith in appellant's applications #421,886 and #421,887. Here, as in those cases, the claim is not limited to a groove in the backing corresponding to the record groove, and here, as in application No. 421,886, the claim would not be allowable if it were so limited, the British patent to Adams-Randall, of record, sufficiently suggesting such a construction. Moreover, there is no relation between the specific coating to which the appealed claim is directed

and a groove corresponding to the record groove made in the material of the backing which might justify the inclusion of both of these features in a single claim. The references do not specifically mention a mixture of collodion and shellac for the surface material, but the patent to Petit suggests the use of these materials separately for this purpose. Ordinarily, invention is not involved in the use of a mixture of substances, each of which has been before used in the position under consideration. Such mixing is frequently adopted in the arts generally, in order to get an average of the desirable qualities of different substances, or to get each of several desirable qualities separately possessed by them. It has not been shown and we do not perceive that this case presents any exception to the ordinary rule in this respect.

The action of the primary examiner finally rejecting the appealed claim is affirmed.

Fairfax Bayard,
T. G. Steward,
Frank C. Skinner,
Examiners-in-Chief.

Back - material of function, not required and so frequently
 same as film - not referred to as a layer over the
 material

U. S. Pat. 838,768

In Adams Randall's
 device, record groove
 does not extend into
 backing unless graphite, which
 is very different from
 an backing as referred to.
Adams Randall (U. S. Pat. 838,768)
 of part 1 uses a backing of
 yielding material - wax is not
 mentioned - and covers this
 with wax, collodion, gelatin
 or other substance that may
 be applied in liquid or semi-
 liquid state. Thin layer of
 plumbago applied to this surface.
 Record is made in plumbago
 + protected by covering of varnish
 or electro depos. copper or
 other metal.

Amerson uses celluloid
 instead of collodion. Celluloid is
 formed by casting nitrocellulose
 in a form. For example, gun cotton is mentioned
 by Amerson with camphor. Celluloid
 is nitrocellulose - but unlike
 gun cotton is sol. in alcohol ether
 and is not as explosive as gun cotton.

U. S. Pat. 838,768 Dec. 4 '29.

Eng. 4058 of 1889 " "

U. S. Pat. 837,927 Dec. 9, 1885.

" " 689,408 " "

P. 386.

Folio No. 387

Serial No. 421885

Applicant.

T. A. Edison

Address.

Orange

Title Phonograph Records (Case B)

Filed Mar. 18, 1908

Examiner's Room No. 379

Assignee

Ass'g't Exec.

Recorded

Liber

Page

Patent No.

Issued

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FRANK L. DYER,
Counsel,

ORANGE, NEW JERSEY.

Call on me
for model 2 ball
reproduction

Dyer

Jan 30 1908

see me about a
4 wheel drive

W. E. Electric Truck
apprenticeship

The object of this invention is to produce
a phonograph record with a hard surface
so as to prevent the reproducing ^{ball or button} point from
wearing the surface ~~and the same in sound~~
~~and~~.

The invention consists in immersing a record
into a solution of a nitrated cotton dissolved
in acetate of amyl as commonly used for
making Kinetograph films -
+ withdrawing the same, leaving a thin
film of the liquid on the surface of
the record - placing the same on a
mandril rotated slowly in a vertical
position until the film is nearly dry
then transferring it to a horizontal
mandril within a heated chamber
+ rotating it slowly while the ~~colored~~
record is brought up gradually to
the softening point but not so far

as to distort the record ~~or~~ the effect
of this is to weld the film to the
record so that when cooled, the
reproducing ball will not tear or
detach it from the ~~the~~ record.

Wax records are preferable for use
Wax records even of the hardest
kind a rapidly worn when the area
of the record waves are greatly
diminished from those now generally
adapted - the thickness of the film is
controlled by the solution being strong or dilute
the film should not be so thick as to interfere with
the volume of sound
Clean the composite record with
the film welded - want get clean in
Record itself - <sup>removal of considerable wax like with
with cellulose soap</sup>
at the process -

2nd patent = 3

I dip the mould or Master in a solution of the ~~cellulose~~ Colloidum let it drain vertically + dry so practically all of the Volatile Solvent is eliminated -

I then dip the mould in the wax in the usual manner ^{by churning + pouring} or mould it by Centrifugal force a la Gips -

In this case the wax welds itself to the record + on contraction draws the film off from the mould + the record is complete + the mould ready for another dipping

In this case no subsequent welding is required - and the film can be thick or thin without ~~the~~ interfering with Volume of sound

4

Another patent -
dipping record in a clear solution of Shellac in a solvent such as Alcohol then welding the Shellac film to the core record by heat,

Another a mixture of Nitrocellulose + Shellac in acetate of any or other Solvents - the Shellac hardens the film -

Dip mould + then weld or make record & then soften + weld -

Dipping record + welding of film dope + shellac works fine - Tomorrow I try moulds +

5

Dyr =

You better carry that
idea (of stripping plating)
on the disk —

After they have the disk
ready for pressing in
shells — you can then
not use it to press
shells as disk, but
plate with Iron or Cobalt
just enough to cause Copper
Color to disappear
then put in Sulphate Copper
Reduce the Iron to Cu sponge
& then wash & plate the
disk out of metal $\frac{1}{32}$
thick for use direct or $\frac{1}{16}$ 1000
& back up with a cement ~~etc~~
alloy ~~etc~~ ^{silica Resonance compound etc}

6

for duplicating you could
make a number shellac disks
& grained the surface &
plate thick Copper plate
 $\frac{1}{16}$ & use these for
plating with instead
of original master

S

copy

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, County of Essex and State of New Jersey;

prays that letters patent may be granted to him for the improvements in

PHONOGRAPH RECORDS, (*Case 73*)

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Orange, New Jersey, his attorney, with full
power of substitution and revocation, to prosecute this application, to make
alterations and amendments therein, to receive the patent, and to transact all
business in the Patent Office connected therewith.

Thomas A. Edison

- SPECIFICATION -

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS ALVA EDISON, a citizen of the United States, and a resident of Llewellyn Park, Orange, County of Essex and State of New Jersey, have invented certain new and useful improvements in PHONOGRAPH RECORDS, of which the following is a description:-

The wax-like compositions now in common use for making phonograph records, such, for example, as that described in patent No. 782,375, granted to Jonas W. Aylsworth, have qualities which make them specially adapted for this purpose. Such materials can be readily molded, give an accurate copy of the surface of the mold or matrix, and after being molded can be reamed out and trimmed off and otherwise worked with great facility. Phonograph records can be made from these materials at low cost, with simple machinery and by very cheap labor. It is a fact, however, that records made from these wax-like compositions and made as is now the common practice, with substantially one hundred record grooves to the inch, after being subjected to a large number of reproductions on the phonograph, show signs of wear and the character of the reproduction obtained therefrom is not so good as at first. Obviously, such records would be more rapidly worn if a narrower record groove and a reproducing stylus of correspondingly decreased size are made use of. It is desirable, therefore, that a record be made which will have a harder and tougher wearing surface and which will

at the same time retain the good moldable and workable qualities of the records made from the wax-like compositions now used.

The object of my invention is to provide a record of the sort just described, made from wax or wax-like composition² and having a hardened wearing surface. My invention also comprises a novel process for making such a record. In the practice of my invention I preferably take a duplicate or original phonograph record, which has been made in any of the usual ways from the usual wax-like composition, and immerse it in a solution of nitrated cotton in any of the ordinary solvents used for this purpose, as for example, acetate of amyl, which is commonly made use of for providing a liquid solution from which films are made for photographic use. I may, if desired, add a small percentage of camphor to the nitrated cotton, thus making a celluloid collodion solution, but this may be dispensed with.

3 After immersing the record in this solution, I withdraw it therefrom, leaving a thin film of the solution adhering to its surface. I then dry this film upon the record. While it is drying I prefer to rotate it slowly upon a vertical mandrel, the mandrel being placed in this position so that the film of collodion will not tend to collect at one side of the record. After the film, which is extremely thin, so that it will not interfere with or obstruct the undulations of the record groove, has been dried, I place it in a heated chamber and rotate it slowly, leaving it in this chamber until the wax-like material of the record has become somewhat softened, but not sufficiently so to result in the malformation or distortion of the

record groove. The effect of this treatment is to weld the film to the record, so that when cooled the latter will have a surface of much greater hardness and toughness than the wax record previously had, and owing to the welding of the film in place, the reproducing stylus will not tear or detach the film from the wax-like material of the record. The thickness of the film may be governed by regulating the strength of the solution, a very dilute solution producing a thin film, as will be understood, and a stronger solution a thicker film. The film must obviously not be thick enough to interfere with the volume of sound produced by the record.

Having now described my invention, I claim:-

1. A phonograph record of wax-like composition and having a hardened collodion surface, substantially as set forth.
2. A phonograph record of moldable wax-like material and having on its surface a film of collodion intimately welded thereto, substantially as set forth.
3. The process of imparting a surface hardening to a phonograph record of wax-like material, which consists in coating a record with a film of surface hardening material, in drying this coating and in welding the coating to the wax-like composition, substantially as set forth.
4. The process of imparting a surface hardening to a phonograph record of wax-like material, which consists in coating the record with a film of collodion solution, in drying this coating and in welding the coating to the wax-like composition by the action of heat, substantially as set forth.

5. The process of imparting a surface hardening to the phonograph record of wax-like material which consists in coating the record with a film of collodion solution, in rotating the record about a vertical axis to dry it, and in heating the record to weld the surface coating thereto, and allowing the record to cool, substantially as set forth.

This specification signed and witnessed this 13 day of March 1908

Thomas A. Edison

Witnesses:

1. Frank L. Dyer

2. Anna B. Kliehm

Oath.

State of New Jersey }
County of Essex } ss.,

THOMAS A. EDISON, the above named
petitioner, being duly sworn, deposes and says that he is a citizen of the United
States, and a resident of Llewellyn Park, Orange, County of Essex
and State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the
improvements in PHONOGRAPH RECORDS,

described and claimed in the annexed specification; that he does not know and
does not believe that the same was ever known or used before his invention or
discovery thereof; or patented or described in any printed publication in the
United States of America or any foreign country before his invention or
discovery thereof, or more than two years prior to this application; or patented
in any country foreign to the United States on an application filed more than
twelve months prior to this application; or in public use or on sale in the
United States for more than two years prior to this application; and that no
application for patent upon said invention has been filed by him or his legal
representatives or assigns in any foreign country.

Sworn to and subscribed before me this 13 day of March 1908

H. H. Dyke

[Seal]

Notary Public.

8-260.

387

Div. Room 779
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

J. H. D.-Li.

Paper No. 1-Letter
All communications regarding this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

April 1, 1908.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.

APR 2 1908

Please find below a communication from the EXAMINER in charge of your application,

for Phonograph Records, filed March 18, 1908, serial number 421,885.

E. B. Moore.

Commissioner of Patents.

Applicant is requested to file a drawing of a tablet
having inscribed thereon the names of the elements constituting the
same and also a diagrammatic ~~ax~~ illustration of the steps of the
process claimed.

Claims 1 and 2 specify a record which may be made by
processes other than that specified in the remaining claims and
accordingly division must be required to the end that claims 1 and 2
be presented in one application and claims 3, 4 and 5 in another
application.

In amending, applicant may consider the following patents:

- / Petit, Dec. 24, 1901, #689,408, (181-16), and
- / Harris, Dec. 11, 1906, #837,927, (181-17).

Folio No. 388

421.886
Serial No. 100

Applicant.

Address.

Thomas A. Edison

Llewellyn Park
Orange, N. J.

Title Photograph Records Case 61

Filed March 18, 1908

Examiner's Room No. 379

Assignee

Ass't Exec.

Recorded

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Patent No.

Issued

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| 3 | Reported April 14, 1909 | 18 | |
| 4 | Amended Apr. 7, 1910 | 19 | |
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| 6 | Official Examiner in Chief 4/21/11 | 21 | |
| 7 | Brief appeal sent Aug. 19, 1911 | 22 | |
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FRANK L. DYER,
Counsel,

ORANGE, NEW JERSEY.

1

Case
2-388

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS A. EDISON,
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, County of Essex and State of New Jersey;

prays that letters patent may be granted to him for the improvements in
PHONOGRAPH RECORDS,

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Orange, New Jersey, his attorney, with full
power of substitution and revocation, to prosecute this application, to make
alterations and amendments therein, to receive the patent, and to transact all
business in the Patent Office connected therewith.

Thos. A. Edison

- SPECIFICATION -

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States, residing at Ilwellyn Park, Orange, County of Essex and State of New Jersey, have invented certain new and useful improvements in PHONOGRAPH RECORDS, of which the following is a description:-

The wax-like compositions now in common use for making phonograph records, such, for example, as those described in Patent No. 782,375, granted to Jonas W. Aylsworth, have qualities which make them specially well adapted for this purpose. Such materials can be readily molded, give an accurate copy of the surface of the mold or matrix, and after being molded can be reamed out and trimmed off and otherwise worked with great facility. Phonograph records can be made from these materials at low cost, with simple machinery and by very cheap labor. It is a fact, however, that records made from these wax-like compositions and made, as is now the common practice, with substantially one hundred record grooves to the inch, after being subjected to a large number of reproductions in the phonograph, show signs of wear and the character of the reproduction obtained therefrom deteriorates. Obviously, such records are more rapidly worn when a narrower record groove and a reproducing stylus of correspondingly decreased size are made use of. It is desirable, therefore, that a record be made which will have a harder and tougher wearing surface and which will at the same time retain the

good moldable and workable qualities of the records made from the wax-like compositions now used.

The object of the present invention is to provide a record of the sort just described made from wax or wax-like composition, and having a hardened and toughened wearing surface. The material which I preferably use for forming this surface is shellac. In the practice of my invention I preferably take a phonograph record which has been made in any of the usual ways from the usual wax-like compositions, and immerse it in a solution of shellac dissolved in a solvent such as alcohol.

After immersing the record in this solution I withdraw it therefrom, having a thin film adhering to its surface. I then dry this film upon the record, and while it is drying I prefer to rotate it slowly upon a vertical mandrel, the mandrel being placed in this position so that the film of shellac will not tend to collect at one side of the record. After the film, which is extremely thin, so that it will not interfere with or obstruct the undulations of the record groove, has been dried, I place it in a heated chamber and rotate it slowly, leaving it in this chamber until the wax-like material of the record has become somewhat softened but not sufficiently so to result in malformation or distortion of the record groove. The effect of this treatment is to weld the film to the record so that when cooled it will have a surface of much greater hardness and toughness than the wax record previously had, and the reproducing stylus will not tear or detach the film from the wax-like material of the record. The thickness of the film may be governed by regulating the strength of the solution, a very dilute solution producing a thin film, as will be understood, and a stronger

solution a thicker film. The film must not be thick enough to interfere with the volume of sound produced by the record.

Having now described my invention, what I claim is:-

1. A phonograph record made of wax-like composition and having a hardened surface of shellac, substantially as set forth.

2. A phonograph record of moldable wax-like material, ~~having a record groove formed on the surface thereof~~ and having on its surface a film of shellac intimately welded thereto, substantially as set forth.

Insert it in claim 2

This specification signed and witnessed this 13th day of March 1908

Thos. A. Edison

Witnesses:

1. Frank L. Dyer
2. Anna R. Klein

Oath.

State of New Jersey } ss.,
County of Essex

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Orange, County of Essex and State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the improvements in PHONOGRAPH RECORDS,

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 13 day of Mar. 1908

Herbert H. Dyer

[Seal]

Notary Public.

Div. 23 Room 379
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-260.

J.H.D.-L1.

Paper No. 1, Red.

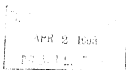
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

April 2, 1908.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application,
for Phonograph Records, filed March 18, 1908, serial number 421,886.

lei

E. B. Moore

Commissioner of Patents.

Applicant is requested to file a drawing of a conventional
tablet with the names of the elements constituting the same inscribed
thereon.

The claims are rejected in view of the British Patent of
Adams-Randall, #1058 of 1889, (181-2), which discloses a varnished
wax-like record, and the patents of Petit, Dec. 24, 1901, #689,408,
(181-16), and Harris, Dec. 11, 1906, #837,927, (181-17).

See index
379

IN THE UNITED STATES PATENT OFFICE

Thomas A. Mison)
PHONOGRAPH RECORDS)
Filed March 18, 1908)
Serial No. 421,886)

Room No. 379

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to Office action of
April 2, 1908, please amend the above entitled case as
follows:

Cancel Claim 1, and renumber Claim 2 and Claim

1.

Add the following as Claim 2:

2. A phonograph record comprising a cylinder of
moldable wax-like material, *having a record groove formed on the surface thereof*
and having a thin film of
shellac intimately welded to its surface, substantially
as set forth.

R E M A R K S

Applicant will file a drawing of a convention-
al tablet before the case goes to issue.

Reconsideration and allowance of the claims
are requested. Adams-Randall does not disclose a film
of shellac intimately welded to the surface of a record
of moldable wax-like material. The intimate welding of
a tough surfacing material to the wax-like record in

applicant's case is the result of the process employed by him as described on page 2 of the Specification and which produces a product different from that disclosed by Adams-Randall. The patents to Harris and Petit referred to by the Examiner both disclose a celluloid surfacing on a foundation, which is an entirely different thing from that claimed by applicant.

Respectfully submitted.

THOMAS A. EDISON

By

Frank L. Ryan

His Attorney

Orange, New Jersey

March 25th, 1909

388

2-260.

Div.....23. Room.....379
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."
J. V. D. - L. I.

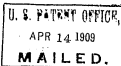
Paper No.3, Re J.
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

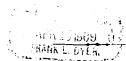
April 14, 1909.

Thomas A. Ellison,
Care Frank L. Dyer,
Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application,

for Phonograph Records, filed March 18, 1908, serial number
421,886.



E. B. Moore

Commissioner of Patents.

This action is in response to the amendment filed the
26th instant.

Adams-randall discloses a varnish and hardening surface
upon a softer record base. This varnish is the equivalent of
applicant's shellac. Petit discloses a lac hardening surface
welded upon any selected record base material. Harris discloses
a celluloid hard surface upon a wax-like base. The examiner
can see no patentable change made by applicant in merely
placing an old lac hardening surface such as Pettit
has disclosed upon a wax-like base, which is evidently included
among the materials Petit covers by his broad statement
relating to his base materials.

The claims are rejected.

[Handwritten signature]

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison :
PHONOGRAPH RECORDS :
Filed March 18, 1908 : Room No. 379.
Serial No. 421,886 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of April 14, 1909, please amend this case as follows:

- ✓ Claim 1, line 2, after "material" insert -
having a record groove formed on the surface thereof - .
- ✓ Claim 2, line 2, insert - having a record groove
formed on the surface thereof - after "material".

R E M A R K S

Reconsideration and allowance of this application as amended are respectfully requested. Adams-Randall does not disclose a record in which a surfacing film is intimately welded to a base of wax-like material having the record groove thereon, since in his case a layer of graphite is interposed between the wax and the protective coating, the record being formed in the graphite. Neither do any of the other references cited by the Examiner show the invention as claimed. The intimate welding of a tough surfacing material to the

wax-like record in applicant's case is the result of the process employed by him as described on page 2 of the specification, which process necessarily produces a different article from that disclosed by the different patentees.

Respectfully submitted,

THOMAS A. EDISON

By Frank L. Dyer
Attorney.

Orange, N. J.
April 7th, 1910.

388

2-260.

Div. Room 293

ADDRESSES ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

J. H. D. -B.

Paper No. 1, Ed.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

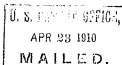
DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

April 23, 1910.

THOMAS A. Edison,
Care Frank L. Dyer,
Edison Laboratory,
Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application,
for Phonograph Records, filed March 18, 1908, serial number 421,886.

E. B. Moore
Commissioner of Patents.

This action is responsive to the amendment filed April
8, 1910.

After a careful consideration nothing is found of
patentable nature in the claims over the references of record
and both claims are finally rejected upon the references and
for the reasons of record.

*Confused
Smith*

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
PHONOGRAPH RECORDS,) Room No. 379.
Filed March 18, 1908,)
Serial No. 421,886.)

HONORABLE COMMISSIONER OF PATENTS:

S I R:

I hereby appeal to the Examiners -in- Chief from the decision of the principal Examiner in the matter of my application for Letters Patent for PHONOGRAPH RECORDS, filed March 18, 1908, Serial No. 421,886, which on the twenty-third day of April, 1910, was finally rejected. The following are the points of the decision upon which the appeal is taken:

1. The Examiner erred in rejecting the claims.
2. The Examiner erred in holding the claims to be without patentable novelty.

An oral hearing is requested.

Very respectfully,

THOMAS A. EDISON

By Frank B. Ryan
His Attorney.

Orange, New Jersey,
April 14th 1911.

IN THE UNITED STATES PATENT OFFICE.

Application of)
Thomas A. Edison, for)
Phonograph Records, f) before the Hon. Board of
Filed March 18, 1908,) Examiners-in-Chief.
Ser. No. 421,886,)
Atty: Frank L. Dyer .)

Examiner's Statement .

This is an appeal from the Examiner's final rejection of the following claims:

1. A phonograph record of moldable wax-like material, having a record groove formed on the surface thereof, and having on its surface a film of shellac intimately welded thereto, substantially as set forth.
2. A phonograph record comprising a cylinder of moldable wax-like material, having a record groove formed on the surface thereof and having a thin film of shellac intimately welded to its surface, substantially as set forth .

The references relied upon are,

Petit, #689,408, Dec. 24, 1901, Acoustics, 16;
Aylsworth, #782,375, -Feb. 14, 1905, (Acoustics, 17),
(Referred to on page 1 of applicant's spec.)

Petit alone meets the claims since Petit states on page 1, line 28, that the material he uses to make the film 8 illustrated in Figure 1, is lac which is the same as shellac, which by the way, is a very common material for making phonograph records of. Petit, however, is not clear as to whether he uses wax-like material for his foundation or body portion 9 illustrated in Figure 1, but to substitute the common wax-like material of Aylsworth for the material of Petit, is not thought to be invention.

Respectfully submitted:

Examiner, Division XXIII .

April 24, 1911 .

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

388

April 26, 1911.

Sir:

The case of

Thomas A. Edison

Serial } No. 42,886 will be heard by the ~~Commissioner~~
~~Inv.~~ } Examiners-in-Chief
on the 14th day of September 1911.

It is the ~~second~~ case on the assignment for that day.

The hearings will commence at ^{ten}~~ten~~_{one} o'clock, and as soon as
the argument in one case is concluded the succeeding case will
be taken up.

If any party, or his attorney, shall not appear when the
case is called, his right to an oral hearing will be regarded
as waived.

The time allowed for arguments is as follows:

Ex parte cases, thirty minutes;
Motions, thirty minutes, each side;
Interference appeals, final hearing, one hour each side.

By special leave, obtained before the argument is commenced,
the time may be extended.

The appellant shall have the right to open and conclude in
interference cases, and in such case a full and fair opening
must be made.

Briefs in interference appeals must be filed in accordance
with the provisions of Rule 147.

Respectfully,

E. P. Moore

Commissioner of Patents.

To *Frank S. Dyer atty.*
Orange
OK J.

To

IN THE UNITED STATES PATENT OFFICE

Application of)	
Thomas A. Edison for)	
PHONOGRAPH RECORDS	)	Before the Honorable Board
Filed March 18, 1908	)	of Examiners-in-Chief.
Serial No. 421,886)	

APPELLANT'S BRIEF

This is an appeal from the Examiner's final rejection of the following claims:-

1. A phonograph record of moldable wax-like material, having a record groove formed on the surface thereof, and having on its surface a film of shellac intimately welded thereto, substantially as set forth.
2. A phonograph record comprising a cylinder of moldable wax-like material, having a record groove formed on the surface thereof and having a thin film of shellac intimately welded to its surface, substantially as set forth.

The applicant's invention relates to phonograph records, and more particularly to a record of readily moldable material which has a tough wearing surface adapted to be subjected to a large number of reproductions without sensible wear. Wax-like compositions now in common use for making phonograph records, such, for example, as those described in patent No. 782,375, granted to Jonas W. Aylsworth, can be readily molded, give an accurate copy of the surface of the mold or matrix, and after being molded, can

be reamed out and trimmed off, or otherwise worked with great facility. Phonograph records can furthermore be made of these materials at low cost, with simple machinery, and by very cheap labor. Records made from these wax-like materials, however, after being subjected to a large number of reproductions on a phonograph, show signs of wear and the character of the reproductions obtained therefrom deteriorates. It is desirable, therefore, that a record be made which will have a harder and tougher wearing surface, and which will at the same time retain the good moldable and workable qualities of the records made from the wax-like composition.

The applicant's invention consists in the provision of a record of such a moldable wax-like material having the record groove formed on the surface thereof and having a surface layer or film of shellac intimately welded to the surface thereof.

In the practice of the invention, a phonograph record which has been made in any of the usual ways from the usual wax-like compositions, is immersed in a solution of shellac dissolved in a suitable solvent, such as alcohol, so that upon withdrawing the record from the solution, a thin film of the solution adheres to the same. This film, which is so thin as not to interfere with or obstruct the undulations of the record groove, is then dried upon the record, the latter being subsequently placed in a heated chamber, where it is left until the wax-like material of the record has become somewhat softened, but not sufficiently so to result in the malformation or distortion of the record groove. This treatment welds the film to the record, so that when cold it will have a film of such hard-

ness that the reproducing stylus will not tear or detach the same from the wax-like material of the record.

The claims are rejected upon the following patents:-

Petit, No. 689,408, December 24, 1901;

Aylsworth, No. 782,375, February 14, 1905.

The Examiner explains the rejection by pointing out that Petit uses shellac for his surface film, and contends that to use Aylsworth's wax-like material for the foundation or body portion of Petit's record would not involve invention.

The Examiner seems to have lost sight of one of the principal features of the invention, namely, that the record groove is formed on the surface of the moldable wax-like material. This feature is not disclosed in any of the references of record. The patent to Petit, which appears to be the principal reference relied upon by the Examiner, discloses in Figure 3 a surface film which has a somewhat irregular interior surface; but a mere inspection of this figure indicates that the inner surface of the film does not contain an accurate copy of the record impression. Petit's intention was evidently to build up a composite record having a record bearing surface veneer, and a foundation (not a record) of a similar material; whereas the applicant's object was to apply to the surface of a complete wax-like record a suitable harder and tougher protective coating. That Petit did not have in mind the applicant's invention is indicated by his reference to the inner portion of his record as a "foundation" or "cylindrical shell", (not a record). (See line 5, page 2). The patent to Aylsworth does not disclose this feature of the applicant's invention.

The Examiner takes the ground that as long as the various materials of the compositions specified in the claims for the surface layer and record have been separately referred to as suitable for making phonograph records, their combination in the manner set forth in the claims in issue does not involve invention. In reference to the materials employed by the applicant, it is submitted that even if these various materials are separately old, there is invention in combining them as set forth in the claims. By reason of the good molding qualities of the wax-like compositions and of the superior wearing qualities of shellac, it is desirable to form a record of the former materials provided with a wearing surface of the latter material. Neither the Petit nor the Aylworth patents point out how this can be done. In lines 14 to 18, page 2 of his patent of record, Petit states as follows:-

"The foundation is preferably made of material adapted to be softened and connected by heat and pressure through adhesion to the duplicate sound record film, and the material of the foundation is preferably of such a nature as to carry a substance of similar nature to that composing the film, either by being impregnated with, or by having an applied surface coating of, such material, so that the connection formed between the two by heat and pressure may be a cementing action. The material of the foundation may be and preferably is the same as that of the film, but loaded with pigment to give body and cheapness."

In view of this statement, Petit's process is evidently not designed for use in connection with different materials such as those specified in the claims in issue. The Aylworth patent offers no suggestion how the wax-like

materials mentioned therein can be welded to shellac.

It is furthermore pointed out that as the material of Petit's foundation is merely rendered plastic and is not melted or fused, the pressing of the same against a thin surface film such as that contemplated by the applicant would be apt to tear or otherwise injure the said film. By the applicant's process as outlined in the specification, this objection is obviated, and the secure welding together of the wax-like record and its surface coating is rendered possible.

The applicant, therefore, by a new process, has produced an article not disclosed in the prior art and one which evidently could not be produced by the processes heretofore known; and the Honorable Board of Examiners-in-Chief are accordingly, in view of the foregoing remarks, respectfully requested to adjudge the claims in issue patentable in their decision on this appeal.

Respectfully submitted,

THOMAS A. EDISON

By J. L. Oger

His Attorney

Orange, New Jersey

August 19, 1911.

2-202

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

378

Thomas A. Edison,.....
c/o Frank L. Dyer, Atty.,
Orange,.....
N. J.....



Sir:

Inclosed find copy of decision this day rendered by the

Examiners in Chief in the { ex parte } case of
 { interference }
Thomas A. Edison, Serial No. 421,886.

By direction of the Commissioner:

Very respectfully,

W. F. Woolard,

Chief Clerk.

J.R.S.

Appeal No. 4223.

U. S. PATENT OFFICE.

October 6, 1911.

Before the Examiners-in-Chief, on Appeal.

Application of Thomas A. Edison for a patent for an improvement in Phonograph Records, filed March 18, 1908, Serial No. 421,886.

Mr. Frank L. Dyer, attorney for appellant.

The applicant has appealed from the action of the primary examiner finally rejecting the following claims:-

1. A phonograph record of moldable wax-like material having a record groove formed on the surface thereof and having on its surface a film of shellac intimately welded thereto, substantially as set forth.

2. A phonograph record comprising a cylinder of moldable wax-like material having a record groove formed on the surface thereof and having a thin film of shellac intimately welded to its surface, substantially as set forth.

The references cited are:-

Petit,	689,408,	December 24, 1901,
Aylsworth,	782,378,	February 14, 1905.

We find no error in the action of the primary examiner rejecting the appealed claims upon reference to Petit, taken in connection with Aylsworth. Petit discloses a phonograph record of moldable material, which is wax-like to the extent that it becomes soft when heated, which record has a record groove on the surface thereof, the surface being formed of a film of shellac intimately welded to the backing. The appealed claims are therefore met in all respects by Petit, unless it be that Petit cannot be said to disclose a material which is in all respects wax-like. However, the use of

a material which is in all respects wax-like for the main body material of the Petit record would certainly not involve invention, especially in view of the common use of wax-like materials in the manufacture of records for phonographs, of which use the Aylsworth patents furnish an example.

The applicant refers, in his argument, to the formation of a groove corresponding to the record groove in the wax-like backing of his record. This construction is disclosed in his application but he has not restricted himself thereto in his appealed claims, which are obviously capable, so far as this feature is concerned, of application to the Petit product. But if the claims were so limited we would not consider them to be allowable over the British patent to Adams-Randall, #1058, of 1889, of record. This patent discloses a record surface having a projection upon the back thereof corresponding to the record groove. To supply this surface with a backing of wax-like material would not be invention, in view of the Petit and Aylsworth patents, if, indeed, the disclosure of the British patent can rightly be held not to disclose such a backing.

The action of the primary examiner finally rejecting the appealed claims is affirmed.

Fairfax Bayard,
T. G. Steward,
Frank C. Skinner,
examiners-in-chief.

For U. S. Post. 830,960, Lm 9. 4-27,
Eng. " 1058 of 1889 " "
" U. S. " 807, 927, Lm 9. 300
" " " 689, 108, " " "

1888.

Folio No. 389

Serial No. 427,361

Applicant.

Address.

Thomas A. Edison

Llewellyn Park
Orange, N. J.

Title Storage Batteries & Means of Treating The Same

Filed March 20, 1908

Examiner's Room No. 175

Assignee Edison Storage Battery Co.

Ass't Exec.

Recorded

Liber

Page

Patent No. 999,762

Issued Aug. 8, 1911

ACTIONS.

- 1 Rejection June 16, 1908 16
- 2 Amended June 16, 1909 17
- 3 Office letter June 26, 1909 18
- 4 Office letter Feb. 7, 1910 19
- 5 Amended Jan. 19, 1911 20
- 6 Amended Feb. 1, 1911 21
- 7 Paid July 6, 1911 22
- 8 23
- 9 24
- 10 25
- 11 26
- 12 27
- 13 28
- 14 29
- 15 30

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Recd
June 23, 1909.
J. L. P.

I take the nickel hydroxide,
+ crush it into small granules
so the whole will pass a
20 mesh screen.

To a quantity of this I
add a concentrated solution
of a Bismuth salt dissolved
in a solvent such as
for instance, Trichloride of
Bismuth in strong Chloride
of ammonia in water —
or Trichloride of Bismuth
dissolved to saturation in
Acetone — Enough solution
is added to cover the solid
nickel hydroxide mass
after soaking several hours
The pores of the nickel

hydroxide become saturated
with the ~~water~~ Bismuth
solution — The latter is
drained off & most of
the adhering solution on
the surface is thrown
off by subjecting the
whole to a Centrifuge —

The mass is now dried
& then thrown into a
10% solution of Potassic
or Sodium Hydroxide —
& heated for several
hours ^{near the boiling point for 1/2 hour at the boiling point} — The liquid is
the caustic solution is
poured off & water
added by successive
additions of warm

3

Water the alkali is washed out the mass is then dried & is ready to be ~~used to be~~ packed in the battery tubes -

Batteries the ~~good~~ nickel hydroxide cathodes contain bromine in the pores. ~~which~~

will not deteriorate in capacity to the same extent ^{even long periods of} as ~~the~~

~~the~~ the plain Ni hydroxide - & by the use of a small percent of lithium hydroxide in the electrolyte of the battery cells the capacity of the cell is very greatly increased especially when the cells are used in, badly

27

Ventilated place which causes the temperature of the cells to rise -

The reason for this action in connection with lithium hydroxide in the potassium hydroxide electrolyte is as yet unknown -

It is not necessary that the pores of the nickel hydroxide should be filled with B-smelt previous to packing in the tubes. The battery plate with its assembled tubes may be soaked in the B-smelt & then dried & sealed in cans ^{which are then washed free of alkali traces -}

Folio No. 390

Serial No. 422,651

Applicant.

Address.

Thomas A. Edison

Llewellyn Park

Orange, N. J.

Title Phonograph Reproducers

Filed Mar. 23 1908

Examiner's Room No. 379

Assignee.

Ass't Exec.

Recorded

Liber

Page

Patent No. 975,340

Issued Nov. 1, 1910

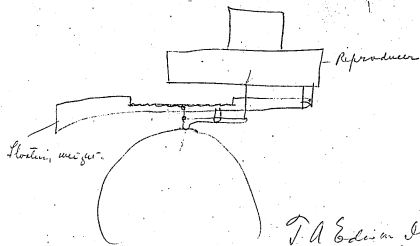
ACTIONS.

1	<u>Rejection April 1908</u>	16	
2	<u>Amended Apr. 6, 1909</u>	17	
3	<u>Office letter May 3, 1909</u>	18	
4	<u>Amended April 30, 1910</u>	19	
5	<u>Allowed May 24, 1910</u>	20	
6	<u>Final fee due Nov. 24, 1910</u>	21	
7	<u>" " pd. Oct. 6, 1910</u>	22	
8		23	
9		24	
10		25	
11		26	
12		27	
13		28	
14		29	
15		30	

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.



T. A. Edison Inc.

Reedley Lewis
with model

Feb 21 1908

Two die springs one counter balance, the other

Mr Dyson

Edison

Reproducer

Heun

Folio No. 391

Serial No. 422849

Applicant.

Address.

Thomas A. Edison

Llewellyn Park

Orange, N.J.

Title Process and Apparatus for Artificially Aging or

Filed Mar 22, 1908 Reasoning Portland Cement Examiner's Room No. 308

Assignee Edison Portland Cement Co.

Ass'g't Exec Nov 26/09 Recorded Nov 27/09 Liber 9,13 Page 67

Patent No. 944,481 Issued Dec 28, 1909

ACTIONS.

- 1 Rejection June 2nd 1908 16 OK Pay
- 2 Appealed May 27 1909 17
- 3 Relieved July 23 1909 18
- 4 Final paid Dec 25 1909 19
- 5 " " paid Nov 29 1909 20
- 6 21
- 7 22
- 8 23
- 9 24
- 10 25
- 11 26
- 12 27
- 13 28
- 14 29
- 15 30

HANK L. DYER,
Counsel,
ORANGE, NEW JERSEY.

Recd 2/10/08
from Prof. D.
S. L. D.

Jan 23rd 1908
769

Defect =

The object of this invention is to age or season Portland Cement rapidly and in a predetermined degree,

The invention consists in heating the Cement after it passes out of the mill - in a rotating cylinder by means of hot air passing through the cylinder, which hot air shall have a given temperature and ~~current~~ is saturated with vapor of water - & then passing the product as it leaves the ~~the~~ cylinder into a storage

2
warehouse where it is given time to permit a reduction of the amount of exterior hydration by a slow hydration of the surfaces adjacent to the surface by a sort of cementation or slow precipitation inward.

Hester has the drawings -

I heat the ore to 200 Fahr
② from 150 to 250 - preferably 200 -

~~The latter~~ see drawings for details -

Edison

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, Orange, in the County of Essex and State of New Jersey, have invented certain new and useful improvements in PROCESS AND APPARATUS FOR ARTIFICIALLY AGING OR SEASONING PORTLAND CEMENT, of which the following is a description:

Under the present practice, in the manufacture of Portland cement, the freshly ground material is stored in a suitable stock house and is permitted to age or season until it is in condition to be used in construction work or to be submitted to the ordinary tests.

Obviously, the absorption of atmospheric moisture is a very slow operation, depending entirely upon the temperature and hygroscopic condition of the air, so that the operation is exceedingly slow and the quality of the cement is likely to vary within considerable limits.

The object of my invention is to provide a process and apparatus by which this treatment may be performed artificially so that the seasoning or aging of the cement may be effected within a short time. At the same time the operations are under such exact control that the quality ^{of the product} may be regulated within very close limits and may ^{be regulated} ^{the new method} be treated absolutely independently of the weather conditions, which factor does not need to be considered in the carrying out of the invention.

In order that the invention may be more fully understood, reference is made to the accompanying drawing, of which Figure 1 is a side elevation, partly in section, of an apparatus suitable for carrying out my improved process; Figure 2 is a detail sectional view of the chamber shown at the left in Figure 1; and Figure 3 is a section on line 3-3 of Figure 1.

In the apparatus shown, 1 is an elongated ^{slightly inclined} hollow cylinder formed of a series of sections having flanges 2, secured together, and supported upon rollers 3, said cylinder being provided with a gear 4 adapted to be driven by the motor 5 through the gearing 6, whereby the cylinder 1 is rotated slowly and in a manner similar to a rotary cement kiln, which it resembles in size and ~~construction~~ ^{shape}. The material to be treated consisting usually of freshly ^{or crushed} ground cement clinker, is fed into the upper end of the cylinder 1, by a screw conveyor 7, which occupies a horizontal tube 8, the inner end of which extends into the end of the cylinder 1 in close proximity to the bottom thereof. The conveyor 7 may be continuously driven by a belt applied to the pulley 9 and material continuously supplied thereto by a conveyor 10 which ^{discharges into} ~~supplies~~ the feed receptacle 11, the bottom of which communicates with the outer end of the conveyor 7. The upper end of the cylinder 1 communicates with a chamber 12 having a partition 13 which divides the same into ascending and descending flues 14 and 15, the lower end of the flue 15 opening into a horizontal flue or settling chamber 16, of greater cross-section than the interior of the cylinder 1. The bottom of said settling chamber is formed with a ^{longitudinal} ~~transverse~~ trough 17 within which is a spiral conveyor 18 ~~which is~~ driven by the motor 19. Below the discharge end of the conveyor

18 is a transverse trough-20 and conveyor-21 for removing the material deposited ^{from} the settling chamber, ~~which is the finished product.~~ The discharge end of the settling chamber 16 communicates through a passage 22 with the interior of a rotary ^{exhaust} fan or blower 23 which delivers a blast into the chamber 24. Within this chamber and extending across the path of the blast is a set of steam pipes or coils-25, and beyond said steam pipes is a pipe-26, for admitting steam into said chamber in the form of a series of jets 27. The chamber 24 is stationary and rests upon the foundation 28. In its forward end is a shouldered pipe 29 for reducing the cross section of the blast, the contracted end of said pipe extending into the lower end of the ^{return} cylinder 1, which end fits within a circular opening formed in the end of the chamber 24. Below the pipe 29 and communicating with the end of the cylinder 1, is a discharge chamber 30 for receiving ~~the~~ material delivered by the cylinder 1, and at the bottom of said chamber 30 is a screw conveyor 31 for continuously removing the material therefrom, ~~said material also constituting the finished product of the process.~~

My improved process may be carried out with the apparatus shown, in the following manner: The cylinder 1 is continuously rotated and ground Portland cement is continuously introduced into the upper end thereof, by ^{the} conveyor 7. The blower 23 is continuously driven by a belt 32, and supplies a blast of air to the chamber 24. The air blast passes around and between the pipes 25 which are heated by steam passing therethrough, and ^{steam is admitted} to the hot blast ~~from the jets 27.~~ The gases, consisting of hot air ^{but not with} and water vapor ~~pass~~ through the contracted end of the pipe 29 into and through

air may be regulated by the steam pipes 25 and should be between 180 and 250 degrees F., preferably about 200 F. as it leaves the chamber 24. The machine removed from the apparatus by the conveyor 31 and 32 may be discharged into a storage warehouse where it is exposed to a reduction of the amount of degree of exposure of the particles of the material by a slow rotation of the interior of the cylinder 1, along which the ground cement is passing in a continuous body. The cement ~~is~~ showered through the hot gases, ~~the~~ being carried up from the bottom of the kiln, on account of its rotation, until it falls from the side of the kiln to the bottom, ~~whereby the fine particles are thoroughly exposed~~ to the action of the heated gases passing through the cylinder. The bulk of material passes through the cylinder from its upper to its lower end, discharging in a continuous stream into the chamber 30 from which it is removed by the conveyor 31, ~~in its finished condition.~~ A considerable percentage of the ground material is, however, carried by the blast through the ~~passage~~ ^{flues} 14 and 15, into the settling chamber 16, where, on account of ~~the~~ ^{its} increased cross section, the velocity of the blast is checked and the material settles to the bottom of said chamber, and is removed therefrom continuously by the conveyors 18 and 21, said material constituting the ~~finished~~ product. The heated air from which the moisture has been extracted by the ground cement, then ~~passes~~ ^{passes} and enters the blower through the passage 22 by which it is driven through the apparatus again in the same manner as before. The air, ~~passing through the blower~~ ^{passing through the blower} is still at a high temperature and therefore there is an economy effected in the amount of heat which must be supplied by the steam pipes 25 since the same particles of air are used over and over again, only such fresh air being used as is necessary to balance the air which is lost through leakage, ~~and~~ ^{the fresh} air being drawn in automatically, by the blower 23. ~~The temperature of the~~

Having now described my invention, what I claim is:

1. A process for artificially aging or seasoning Portland cement which consists in subjecting a ~~continuous~~ ^{moving mass} stream of ground cement to a ~~continuous~~ current of heated air containing water vapor, substantially as set forth.

2. A process for artificially aging or seasoning Portland cement which consists in subjecting ^{a mass of} ground cement to a continuous current of heated air containing water vapor, continuously adding fresh material ^{to said mass} thereto, and continuously removing the ^{hydrated} ~~hydrated~~ product therefrom, substantially as set forth.

3. A process for artificially aging or seasoning Portland cement which consists in ^{passing} ~~subjecting~~ ground cement ^{through a slightly inclined rotating} ~~into one end of a substantially horizontal cylinder, causing~~ the same to progress through said cylinder and passing therethrough a current of heated air containing water vapor, substantially as set forth.

4. A process for artificially aging or seasoning Portland cement which consists in ^{passing} ~~subjecting~~ ground cement ^{through a slightly inclined rotating} ~~into one end of a substantially horizontal cylinder, causing~~ the same to progress through said cylinder, passing therethrough a current of heated air containing water vapor, and passing said current of air into a settling chamber after leaving said cylinder, substantially as set forth.

5. A process for artificially aging or seasoning Portland cement which consists in ^{unfolding} ~~passing~~ a continuous current of air around a closed path and causing said air to pass over or through a body of ground cement during its travel around said path, substantially as set forth.

6. A process for artificially aging or seasoning Portland cement which consists in ^{impelling} ~~passing~~ a continuous current of air around a closed path, heating said current of air and causing the same to pass over or through a body of ground cement during its travel ^{around said path} ~~through a portion of its~~ path, substantially as set forth.

7. A process for artificially aging or seasoning Portland cement which consists in ^{impelling} ~~passing~~ a continuous current of air around a closed path, heating said current of air, ^{and introducing water vapor into} causing the same to pass over or through a body of ground cement, ^{during its travel around said path} ~~and introducing water vapor into said~~ current of air ^{thereby} ~~during its travel~~ through a portion of its path, substantially as set forth.

8. A process for artificially aging or seasoning Portland cement which consists in ^{impelling} ~~passing~~ a continuous current of air around a closed path, ~~and~~ causing said air to pass over or through a body of ground cement during its travel around said path, and checking the velocity of said air current during its travel through a portion of its path to permit the settling of the particles of cement ^{thereby} ~~carried by said air current~~, substantially as set forth.

9. In an apparatus of the character described, the combination of an elongated ^{tube} ~~body~~ adapted to contain a body of ground cement, means for feeding material into one end thereof, and means for passing a current of heated air and water vapor therethrough, in contact with said material, substantially as set forth.

10. In an apparatus of the character described, the combination of an elongated ~~tubular~~ ^{tube} body adapted to contain a body of ground cement, means for feeding material into one end thereof, means for passing a current of heated air and water vapor therethrough in contact with said material, ~~and~~ ^{and} a settling chamber communicating with the outlet of said ~~tubular~~ ^{tube} and means for removing material ~~therefrom~~, substantially as set forth.

11. In an apparatus of the character described, the combination of an elongated ~~tubular~~ ⁹ ~~body~~ adapted to contain a body of ground cement, means for feeding material into one end thereof, means for passing a current of heated air and water vapor therethrough in contact with said material, and means for rotating said ~~tubular~~ ^{tube} ~~body~~, substantially as set forth.

12. In an apparatus of the character described, the combination of an elongated ~~tubular~~ ^c ~~body~~ adapted to contain a body of ground cement, means for feeding material into one end thereof, means for passing a current of heated air and water vapor therethrough in contact with said material, a settling chamber communicating with the outlet of said ~~tubular~~ ^{tube} ~~body~~, and means for removing material ~~therefrom~~, said settling chamber extending substantially parallel to said ~~tubular~~ ^{tube} ~~body~~ and connected with ~~the~~ ^{both} ~~ends~~ thereof, substantially as set forth.

13. In an apparatus of the character described, the combination of an elongated ~~tubular~~ ^{tube} ~~body~~ adapted to contain a body of ground cement, means for feeding material into one end thereof, means for passing a current of heated

air and water vapor therethrough in contact with said material, a settling chamber ~~communicating with the outlet of said tubular bore~~, means for removing material therefrom, ~~said settling chamber~~ extending substantially parallel to said tubular bore and connected with the ~~inlet~~ ^{both} end thereof, and means for impelling said air current situated between the outlet of said settling chamber and the ~~inlet of said tubular bore~~ ^{tube}, substantially as set forth.

14. In an apparatus of the character described, the combination of an elongated ~~tubular bore~~ ^{tube} adapted to contain a body of ground cement, means for feeding material into one end thereof, means for passing a current of heated air and water vapor therethrough in contact with said material, a settling chamber ~~communicating with the outlet of said tubular bore~~ ^{tube}, means for removing material therefrom, ~~said settling chamber~~ ^{tube} extending substantially parallel to said ~~tubular bore~~ ^{tube} and connected with the ~~inlet~~ ^{both} end thereof, and means for impelling and heating said air situated between the outlet ^{of said settling} chamber and the inlet ^{tube} of said ~~tubular bore~~, substantially as set forth.

1. A process for artificially aging or seasoning Portland cement which consists in moving a mass of the ^{ground} cement in one direction, agitating it, and passing ~~there through~~ ^{it} a continuous current of heated moist air moving in the opposite direction ^{so that it is set forth} _{impelling it}

2. Continuous current of heated moist air in one direction, ^{alternately} showering ~~there through~~ a mass of the ground cement, and forcing the same in the direction opposite to that of the air

6. Insert in ⁵ and causing the cement to pass ~~travel~~ in the direction opposite to that of the air

Folio No. 393

Serial No. 422,652

Applicant.

Address.

Thomas A. Edison

Llewellyn Park

Orange, N.J.

Title Bearings

Filed Mar. 28, 1908

Examiner's Room No. 321

Assignee Thomas A. Edison, Dec.

Ass't Exec June 30, 1910 Recorded July 7, 1910 Liber 127 Page 52

Patent No. 1,013,869

Issued Jan. 9, 1912

ACTIONS.

- 1 Rejection, May 3, 1908. 16 foreign copies to
- 2 Abandoned May 28, 1909. 17 be filed on this copy
- 3 Wald abandoned May 24, 1909 18 as per instructions from
- 4 Retention to Reissue granted June 11, 1910 19 F. L. D. 7/11/11
- 5 Amended June 2, 1911 20
- 6 Rejection June 14, 1910. 21
- 7 Amended June 2, 1911 22
- 8 Allowed July 7, 1911. 23
- 9 Final decision Jan. 7, 1912 24
- 10 Paid Dec. 7, 1911. 25
- 11 26
- 12 27
- 13 28
- 14 29
- 15 30

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

TRADE MARK
Thomas A. Edison

The Edison Portland Cement Co.

ROBERT H. THOMPSON, PRESIDENT
W. B. MALLORY, VICE-PRESIDENT
THOMAS A. EDISON, CHIEF MANAGER
WILLIAM K. BAIRD, SECRETARY
J. P. HANCOCK, TREASURER

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS, STEWARTSVILLE, N. J.

SALES OFFICES:
PHILADELPHIA, PA., Real Estate Trust Bldg
NEW YORK, N. Y., St. James Building
PITTSBURGH, PA., McKeesey Building
NEWARK, N. J., Union Building
BOSTON, MASS., Post Office Square Bldg

Feb. 5th, 1908.

Dyer

Dear Mr. Edison:--

The boys report that the oil bearing used on
the high speed coal blower ^{for the} is a great success, as it feeds
a tremendous amount of oil and keeps the bearings cool.
Have you applied for patent? If not, think it would be
well to do so.

Yours very truly,

W. Mallory
V. P.

WSM-JER

*He had used some
oil once - 4*



The Edison Portland Cement Co.

ROBERT H. THOMPSON, PRESIDENT
W. H. MASON, VICE-PRESIDENT
THOMAS A. EDISON, CHIEF MANAGER
WILLARD F. HORN, SECRETARY
J. P. FRANKLIN, TREASURER

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS, STEWARTSVILLE, N. J.

Feb. 26, 1908.

SALES OFFICES:
PHILADELPHIA, PA., Real Estate Trust Bldg.
NEW YORK, N. Y., St. James Building
PITTSBURGH, PA., Machinery Building
BIRMINGHAM, N. Y., Union Building
BOSTON, MASS., Post Office Square Bldg.



Frank L. Dyer, Esq.,
Legal Department,
Orange, N. J.

Dear Sir:

Your favor of the 24th inst., addressed to Mr. Mallory, duly received, and in accordance therewith we have asked our Mr. Mason to prepare a blueprint of the oil bearing used on the high speed coal blower for kilns and for which he desires a patent applied for.

Yours truly,

H-H

William A. Brown
Asst. to Vice-President.



The Edison Portland Cement Co.

ROBERT H. THOMPSON, PRESIDENT
W. B. MALLORY, VICE-PRESIDENT
THOMAS A. EDISON, CHIEF MANAGER
WILLIAM F. EDDY, SECRETARY
J. P. HANCOCK, TREASURER

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS, STEWARTSVILLE, N. J.

SALES OFFICES:
PHILADELPHIA, PA., Real Estate Trust Bldg.
NEW YORK, N. Y., St. James Building
PITTSBURGH, PA., Machinery Building
NEWARK, N. J., Union Building
BOSTON, MASS., Post Office Square Bldg.

March 3, 1908.

Mr. Frank L. Dyer,
c/o Edison Laboratory,
Orange, N. J.

MAILED 4-1908

Dear Sir:

Enclosed we are sending you blue-prints showing the high speed oil bearing mentioned in our letter of Feb. 5th. I do not know whether it is possible to patent this bearing, but our experiments have shown it to be most satisfactory on high speed.

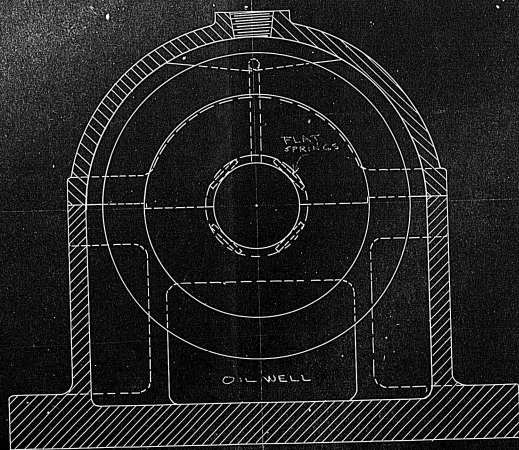
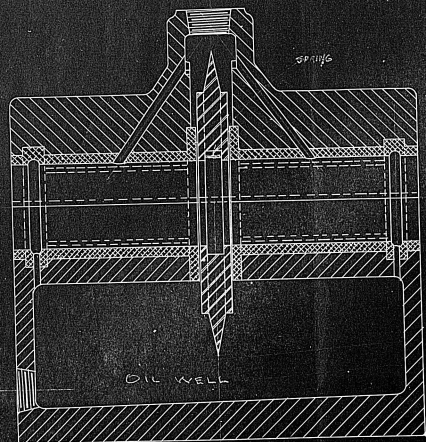
The disk in the center fits loose on the shaft and is held by the four flat springs shown in dotted lines. This gives it enough friction to throw the oil by centrifugal force to the top of the bearing where it runs out on two side grooves thus keeping up continual circulation.

Yours very truly,

WM-CEM

(enc)

Edison as in
Bearing Sup't



EDISON PORTLAND CEMENT CO.
 STEWARTSVILLE, N.J.
 COAL FAN BEARING
 & OIL RING.

2/10/08 - S.E.C.

Folio No. 394

Serial No. 422 610

Applicant.

Address.

Thomas A. Edison

Llewellyn Park
Orange, N.J.

Title Apparatus for Reproducing Motion & Sounds

Filed Mar. 25, 1908

Examiner's Room No. 312

Assignee

Ass't Exec.

Recorded

Liber

Page

Patent No.

Issued

ACTIONS.

1 Rejected May 7, 1908	16
2 Amended May 5, 1909	17
3 Office letter May 22, 1909	18
4 Amended July 12, 1910	19
5 Office letter June 21, 1910	20
6 Amended June 5, 1911	21
7 Rejected July 12, 1911	22
8	23
9	24
10	25
11	26
12	27
13	28
14	29
15	30

PAID

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Petition.

To the Commissioner of Patents:

Your Petitioner *Thos. Edison*

a citizen of the United States, residing and having a Post Office address at

prays that letters patent may be granted to him for the improvements in

App. for Reproducing Motion & Sounds

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration No. 560), of Orange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thos. Edison

- SPECIFICATION -

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States, residing at Hlowellyn Park, Orange, County of Essex and State of New Jersey, have invented certain new and useful improvements in APPARATUS FOR REPRODUCING MOTION AND SOUNDS, of which the following is a description:-

In my application for patent, Serial No. 414,924, filed February 8th, 1906, I have shown and described an apparatus and process for recording motion and sounds simultaneously by means of a moving picture camera and a recording phonograph, and for reproducing the motion and sounds so recorded by means of a moving picture projecting machine, wherein is exhibited a positive film formed from the negative, and a reproducing phonograph, a simple form of mechanical actuating mechanism being provided for driving both the phonograph and the camera, during the performance of the act or scene, and the same or a precisely similar form of driving mechanism being made use of to operate the moving picture projecting machine and the reproducing phonograph during the reproduction of the sound and motions which had previously been recorded. I have found that it is essential to the successful operation of these devices in unison that a simple form of mechanical driving means, common to both the machines, be provided, other arrangements for effecting the synchronous operation of these instruments, such, for example, as synchronous electric motors operating at a distance from one another,

being too complicated, expensive and generally unreliable to secure successful and practical results. In the practical operation of such devices, however, in theatres or other large buildings at a distance from the studio where the sounds and motions were originally recorded, it is impracticable to extend an ordinary form of mechanical drive, such, for instance, as a shaft used for driving both devices, from the neighborhood of the moving picture projecting machine to the neighborhood of the reproducing phonograph, when the latter is placed behind or near the screen whereon the pictures are being exhibited.

The object of the present invention is to provide an apparatus whereby the projecting machine used for projecting moving pictures, and the reproducing phonograph, which is used for reproducing the sounds originally recorded synchronously with the making of the pictures upon the moving picture film, may be placed in convenient adjacent relation to one another, and operated from a simple form of mechanical actuating means common to both, and the sounds which have been recorded upon the phonograph may be reproduced in the immediate neighborhood of the screen upon which the pictures are thrown, so that the sounds shall appear to emanate from the screen, although the phonograph is situated in the immediate neighborhood of the projecting machine and at a considerable distance from the screen.

Within the scope of my invention, I may make use of a variety of means for transmitting the vibrations imparted to the stylus of the phonograph by the phonograph record, to the neighborhood of the screen and thence reproducing the sounds originally recorded upon the record, The preferable means which I employ for this purpose, com-

prises a telephone circuit whereon is impressed an electric current varying in strength in correspondence with the vibrations imparted to the phonograph stylus as it traverses the phonograph record, and means in the neighborhood of the screen for transforming the undulations of the electric current into amplified atmospheric vibrations.

In order that my invention may be better understood, attention is directed to the accompanying drawing, wherein Figure 1 is a diagrammatic view showing the preferred relative arrangement of the kinetoscope, phonograph, and loud speaking telephone; Figure 2, is a diagrammatic view, partly in cross-section, showing the transmitting mechanism and one form of receiving mechanism, and Figure 3, is a view similar to Figure 2, but showing a modified form of sound amplifying receiving mechanism. In all of the Figures of the drawings, the same reference numerals are used to indicate the same parts.

Referring to Figure 1, reference numeral 1 indicates a portable stand on which the kinetoscope 2 and the phonograph 3 are mounted, the phonograph preferably being firmly secured to the stand, as for example, by means of screws. The form of this stand may be varied to adapt it to be placed in the locations provided for kinetoscopes in theatres and the like, which are sometimes difficult of access and require stands specially constructed for the particular location. Common driving means for the phonograph and kinetoscope is provided, in the illustration one of these machines being shown as being driven from the other through a belt or sprocket chain 4. It is evident, of course, that with the machines connected up in this way, the kinetoscope may be driven from the phonograph

motor or the phonograph may be driven from the kinoscope or the two machines may be separately connected to a single source of power, it being important only that a simple form of mechanical driving means be employed, common to both machines. 5 indicates a screen whereon the picture is thrown by the kinoscope, and 6 the receiving apparatus, by which the sound is audibly reproduced in the neighborhood of and preferably behind the screen whereon the motion pictures are displayed. By the employment of a sound amplifying receiver or by providing a separate sound amplifier, the sounds may be given sufficient strength and volume to carry to every part of the building. A transmitter 7 replaces the reproducer ordinarily used upon the phonograph, ^{the} ~~the~~ circuit connecting the transmitter and receiver being shown at 8. By arranging the kinoscope and phonograph in fixed relation to one another and preferably upon a single stand, and establishing connections between the transmitter on the phonograph and the receiver, by means of a flexible conductor, it will be apparent that the stand bearing the kinoscope and phonograph can be placed in whatever position is most convenient and the sounds made to emanate from the neighborhood of the screen, and at the same time the kinoscope and the phonograph may be driven by a simple mechanical form of actuating means, which is necessary in order to successfully maintain the synchronism between the moving film and the rotating record necessary to reproduce the sounds and motions in the precise relations which existed between them when the act or scene was performed.

It is understood that the record and negative are formed simultaneously. This may be done, for example, by

The process and with the apparatus set out in my earlier application above referred to. The gearing used to operate the two machines during the reproduction of sounds and motions, is so proportioned as to rotate the machines at precisely the same relative speed as existed between the corresponding machines during the process of recording, so that when the two machines have once been set into operation the film and record in the precise relation existing between them during the original performance of the act or scene, this identical relation will be maintained throughout the exhibition and reproduction. Means for simultaneously setting the devices into operation in the said relation is disclosed in my earlier application already referred to and such means while it may be made use of in connection with apparatus of the present invention, forms no part hereof.

The telephone transmitter shown in Figure 2 is a magneto transmitter provided with a diaphragm 2, having a phonographic stylus operatively connected thereto, this entire device being used to replace the ordinary reproducer of the phonograph. The diaphragm 2 thus serves both as the diaphragm of a phonograph reproducer and as the diaphragm of the transmitter 7. To the diaphragm 2 of the transmitter a stylus lever 10 is connected by means of a link 11, the stylus lever being pivoted on the floating weight 12, and bearing the stylus or reproducing point or ball 13. This method of pivoting the stylus lever, which is common in phonographs, makes it possible for the stylus to adjust itself to any eccentricities or other considerable variations in the record and to truly follow the record groove. The vibrations of the stylus 13 cause

similar vibrations in the diaphragm 9, which acts to impress undulating currents of electricity upon the circuit 8, as in any ordinary telephone transmitter. This circuit 8 is connected with a suitable telephone receiver which may be of the ordinary type, or it may be of the motograph or loud speaking telephone type. In either case the receiver may be supplemental ^{or} in its action by means of a sound amplifying mechanism if loud sounds are desired to be produced.

In Figure 2 I have illustrated a receiver of the motograph type, the chalk cylinder 14 of the motograph being connected with one branch of the circuit 8, while the electrode or pen 15 of the motograph, as it is commonly called, is connected with the other branch of the circuit. As is well-known, the motograph, which is of my invention and which is described in United States Letters Patent, No. 221,957, dated November 25, 1879, is operated by variations in friction produced by the passage of electric currents of varying strength from the pen or electrode into the constantly rotating chalk 14, ^{or motion} the degree of pressure between these parts being regulated by means of a screw or equivalent device 16, and the vibrations produced being transmitted to a diaphragm 17, which sets up vibrations in the atmosphere corresponding to those impressed upon the electric current at the transmitter, and these vibrations may be further amplified by means of a horn 18 (See Fig. 1).

In Figure 3, I have shown a receiver having operatively connected therewith a sound amplifying mechanism whereby the sounds transmitted may be very greatly amplified. The chalk receiver is shown in this figure as a

means of transforming the undulations of the electric current into mechanical vibrations, but it is understood, of course, that any form of telephone receiver could be substituted for that shown. The vibrations of the pen or electrode 19 (when the chalk receiver is used for the purpose of receiving the sounds) are communicated to an amplifying sound producing mechanism. I may make use of any known form of amplifying mechanism for this purpose, such, for example, as those which are operated by friction, but for the purposes of illustration I have shown the pen or electrode connected to the valve 19 of an amplifying reproducer which is operated by means of ~~an air-current~~ ^{the air-current which is drawn through the aperture 20}. This reproducer is preferably of the form shown and described in the application of Alexander M. Pierman, Serial No. 307,324, filed March 27, 1906, and is preferably operated by suction, a current of air being drawn through the aperture 20 in the side of the reproducer, it being understood that fluid pressure instead of suction may be made use of, in which case it will be necessary to reverse the relative positions of the valve 19 and its seat. This amplifying reproducer, however, is no part of my invention, it being understood that this device or any other equivalent device may be made use of for this purpose.

The operation of the devices which have been described is as follows:- A positive moving picture film is placed in the kinetoscope and a phonograph record is placed upon the mandrel of the phonograph, the positive film being made from a negative which was taken simultaneously with the production of the phonograph record or the master record of which such record is a duplicate. The mechanism is set into operation and the motion picture is displayed upon the screen by the kinetoscope, and at the same time

the sounds originally produced simultaneously with the making of the picture are reproduced behind the screen or in its immediate neighborhood by means of the telephone receiver and sound amplifier. The production of the sounds is caused by the phonograph stylus, vibrated from the phonograph record, imparting its vibrations to the diaphragm g, and the vibrations of this diaphragm impresses entirely corresponding undulations of the electric current upon the circuit g, which undulations are transformed into mechanical vibrations by means of the telephone receiver, the mechanical vibrations set up being imparted directly to a diaphragm whereby sound waves are set up in the atmosphere, or else the mechanical vibrations are imparted to an amplifying device which causes sound vibrations of great force to be set up in the atmosphere.

Having now described my invention, I claim:-

1. The combination of a kinetoscope, a phonograph comprising a vibratable stylus, common mechanical driving mechanism for the two machines, and means for transforming vibrations of the phonograph stylus into sound vibrations emanating from a point at a distance from the phonograph, substantially as set forth.

2. In devices of the class described, the combination of a kinetoscope, a phonograph, common mechanical actuating mechanism for the two machines, a screen whereon motion pictures may be projected by the kinetoscope, and means for transmitting the sound vibrations produced by the phonograph ~~to the screen~~ *to a point directly adjacent to the screen and distant at said point so great that the sound produced by such vibrations of the screen, substantially as set forth.*

3. In devices of the class described, the combination of a kinetoscope, a phonograph, common mechanical

actuating mechanism for the two machines, a screen whereon motion pictures may be projected by the kinetoscope, means for transmitting the sound vibrations produced by the phonograph so that they emanate from the neighborhood of the screen, and means for amplifying the sounds, substantially as set forth.

4. The combination of a kinetoscope, a phonograph in proximity thereto and comprising a vibratable stylus, single mechanical driving mechanism common to the two machines, a screen whereon motion pictures may be displayed by the kinetoscope, and means for transforming the vibrations of the phonograph stylus into corresponding sound vibrations in the neighborhood of the screen, substantially as set forth.

5. The combination of a kinetoscope, a phonograph in proximity thereto and comprising a vibratable diaphragm, single mechanical driving mechanism common to the two machines, a telephone transmitter adapted to transform the vibrations of the phonograph diaphragm into undulations in an electric current, a telephone receiver and an electric circuit connecting the said transmitter and receiver, substantially as set forth.

6. The combination of a kinetoscope, a phonograph in proximity thereto and comprising a vibratable diaphragm, single mechanical driving mechanism common to the two machines, a telephone transmitter adapted to transform the vibrations of the phonograph diaphragm into undulations in an electric current, a telephone receiver, an electric circuit connecting the said transmitter and receiver and a sound amplifying device operatively connected with the said receiver, substantially as set forth.

7. The combination of a kinetoscope, a phonograph comprising a vibratable diaphragm, a single mechanical driving mechanism common to the kinetoscope and phonograph, a screen whereon motion pictures may be projected by the kinetoscope, a telephone transmitter adapted to transform the vibrations of the phonograph diaphragm into undulations of an electric current, a telephone receiver and an electric circuit connecting said transmitter and receiver, substantially as set forth.

8. The combination of a kinetoscope, a phonograph comprising a vibratable diaphragm, a single mechanical driving mechanism common to the kinetoscope and phonograph, a screen whereon motion pictures may be projected by the kinetoscope, a telephone transmitter adapted to transform the vibrations of the phonograph diaphragm into undulations of an electric current, a telephone receiver, an electric circuit connecting said transmitter and receiver, and a sound amplifying device operatively connected with the said receiver, substantially as set forth.

9. In devices of the class described, the combination of a kinetoscope, a phonograph comprising a vibratable diaphragm in proximity thereto, common mechanical actuating means therefor, means for transmitting the vibrations of the diaphragm into corresponding undulations in an electric current and means at a distance from the kinetoscope and phonograph for transforming the undulations of the electric current into sound vibrations, substantially as set forth.

10. In devices of the class described, the combination of a kinetoscope, a phonograph comprising a vibratable

diaphragm in proximity thereto, common mechanical actuating mechanism for the two machines, a screen whereon motion pictures may be projected by the kinetoscope, means for transforming the vibrations of the phonograph diaphragm into undulations of an electric current, means in the vicinity of the screen for reconverting the undulations of the electric current into mechanical vibrations, and sound amplifying means adapted to transform the said mechanical vibrations into amplified air waves, substantially as set forth.

Inventor: C. E. Kline & J. H. Kline
By: J. H. Kline

This specification signed and witnessed this 13 day of Mar. 1908

Thos. A. Edison

Witnesses:

1. Frank L. Dyer

2. Wm. R. Keeler

Oath.

State of New Jersey }
County of Essex } ss.,

Thos. A. Edison, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of

that he verily believes himself to be the original, first and sole inventor of the improvements in app. for Reproducing Motion & Sounds

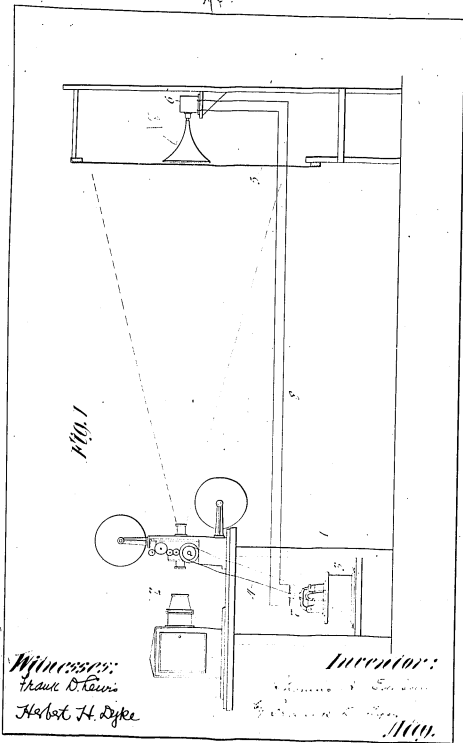
described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 13 day of Mar 1908

H. N. Dyer

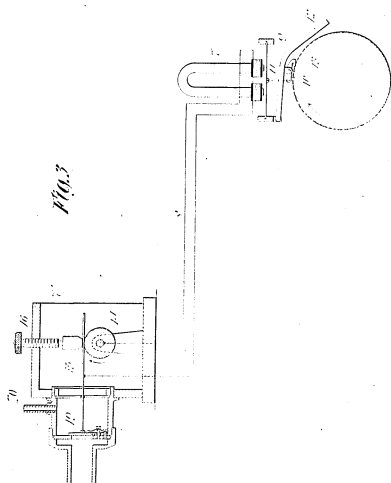
[Seal]

Notary Public.



Witnesses:
Frank D. Lewis
Harold H. Dyke

Inventor:
Harold H. Dyke
Atty.



Witnesses:
 Frank D. Lewis
 Herbert H. Dyke

Inventor:
 Herman S. Brown
 By *Herbert H. Dyke*
 Att'y.

394

2-260.

Div. 7 Room 312, M.
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

Paper No. 1

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

Thomas A. Edison,

C/o Frank L. Dyer,

Orange,

New Jersey.

Please find below a communication from the EXAMINER in charge of your application,

Apparatus for reproducing Motions and sounds, filed March 23,
1908, Serial #422,650.



E. B. Moore

Commissioner of Patents.

This case has been examined.

Claims 1, 2, 4, 5, 7 and 9 are rejected on
Not in line 294
German, #104,475, Berthon, et.al., July 31, 1899; (88--16).

The remaining claims are rejected on the patent to
Berthon et.al., in view of

U.S. #675,566, Higham, July 16, 1907;
(181- Sound Boxes- Gramophones);

which shows means for amplifying telephonic sounds.

K.

Examiner.

2 May 92

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison

APPARATUS FOR REPRODUCING
MOTION AND SOUNDS

Filed March 23, 1908

Serial No. 422,650

Room No. 312

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to Office action of May
7, 1908, please amend the above entitled case as follows:

Page 4 of the Specification, line 14, change
"the" before "circuit" to - a - . Line 15, erase "being".

Page 6, line 7, change "supplemental" to -
supplemented - . Line 20, after "chalk" insert - cyl-
inder - .

Cancel Claim 1.

Claim 2, lines 6 and 7, erase "so that they
emanate from the neighborhood of the screen" and sub-
stitute therefor - to a point closely adjacent to the
screen, and means at said point for giving forth the
sounds produced by such vibrations - . Renumber this
claim as 1.

Cancel Claims 3, 4, 5, 6, 7, 8, 9 and 10, and
substitute the following claims numbered 2 to 7 inclusive:

Cancelled 6/3/11
2. In devices of the class described, the combina-
tion of a kinetoscope, a phonograph adjacent thereto,
common actuating mechanism for the two machines, a screen

whereon motion pictures may be projected by the kinetoscope, vibratable means at a distance from the phonograph and closely adjacent to said screen, and means for causing the said vibratable means to vibrate in accordance with the vibrations set up by the said phonograph, substantially as set forth.

3. In devices of the class described, the combination of a kinetoscope, a combined ~~telephonetransmitter~~ phonograph and telephone transmitter closely adjacent thereto and comprising a diaphragm, means for vibrating the same in accordance with sound vibrations, and means for impressing corresponding undulations thereby on an electric circuit, said circuit, driving mechanism for the kinetoscope and phonograph and a telephone receiver in said circuit, substantially as set forth.

4. In devices of the class described, the combination of a kinetoscope, a combined phonograph and telephone transmitter closely adjacent thereto and comprising a diaphragm, means for vibrating the same in accordance with sound vibrations, and means for impressing corresponding undulations thereby on an electric circuit, said circuit, driving mechanism for the kinetoscope and phonograph, a screen whereon motion pictures may be projected by the kinetoscope and means closely adjacent to said screen for transforming the vibrations of said circuit into amplified sound, substantially as set forth.

5. In devices of the class described, the combination of a kinetoscope, a combined phonograph and telephone transmitter closely adjacent thereto and comprising a

diaphragm, means for vibrating the same in accordance with sound vibrations, and means for impressing corresponding undulations thereby on an electric circuit, said circuit, driving mechanism for the kinetoscope and phonograph, a screen whereon motion pictures may be projected by the kinetoscope and a chalk receiver, ^{having means for sound reproduction associated with the} for transforming the vibrations of said circuit into amplified sound, substantially as set forth.

6. In devices of the class described, the combination of a motograph, means for operating the same, and an air reproducer operated by said motograph, substantially as set forth.

7. In devices of the class described, the combination of a rotating chalk cylinder, a friction member resting in contact with the same, an electric circuit including the said parts, and an air reproducer comprising a valve connected to the said friction member, substantially as set forth.

REMARKS

The Examiner is requested to apply the reference character 18 to the amplifying horn shown in Figure 1 of the drawings.

Reconsideration and allowance of the claims as amended are respectfully requested. It is to be noted that the German patent discloses the idea of carrying the sound telephonically from the phonograph to the various persons seated in the audience. Applicant, on the contrary, discloses the idea of having the phonographic sounds emanate from an amplifying horn placed back of or closely adjacent to the screen, so that sounds appear to emanate

therefrom during the projection of the moving pictures thereon. It also is to be noted that in applicant's device a single diaphragm performs the double functions of telephone transmitter diaphragm and phonograph diaphragm, whereas, no such construction is shown in the German reference. The new claims as submitted herewith are patentably and specifically different from the references of record, and applicant is thought to be entitled to the same.

Respectfully submitted.

THOMAS A. EDISON

By

Frank L. Dyer

His Attorney

Orange, New Jersey

May 5th, 1909.

394

2-260.

Div. 7. Room 112
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

M. Paper No. 3

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

May 22, 1909.

Thomas A. Edison,
c/o Frank L. Dyer,
Orange,



N. J.

Please find below a communication from the EXAMINER in charge of your application,

Apparatus for Reproducing Motions and Sound, filed March 23, 1908,
Serial #422,650.

E. B. Wilson

Commissioner of Patents.

Case considered as amended May 6, 1909.

Claims 6 and 7 appear to cover a special form of amplifier
which is in no way specifically adapted to the art in which this
application is being examined. Such devices are classified under
Phonographs, Class 181--2. Division is therefore required before
further action will be taken on the merits or novelty.
S.



Examiner.

Revised

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)
: APPARATUS FOR REPRODUCING)
: MOTION AND SOUNDS) Room No. 312.
: Filed March 23, 1908)
: Serial No. 422,650)

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to Office letter of May
22, 1909, please amend this case as follows:

Cancel Claims 6 and 7.

R E M A R K S

Claims 6 and 7 have been canceled in response
to the Examiner's requirement of division, the right
to file a divisional application upon the subject matter
of these claims being reserved. An action upon the
merits of the remaining claims and allowance of the
application are requested.

Respectfully submitted,

THOMAS A. EDISON

By *Frank L. Dyer*

His Attorney

Orange, New Jersey

May 12th, 1910.

2-260.

Div. Room 312
ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

Paper No. 394

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

BWT.

June 21, 1910.

Thomas A. Edison,

C/o Frank T. Dyer,

Orange, N.J.

Please find below a communication from the EXAMINER in charge of your application.

422,650, filed March 23, 1908, for Apparatus for Reproducing Motions
and Sounds.

E. B. Moore

Commissioner of Patents.

In response to amendment filed May 13, 1910.

Claim 1 is rejected on the

Pr. Pat. to Faria, 375,869, Mar. 1, 1907, (38-3.D.) *see file 381*
or on the " " " Pomarède, 375,057, May 3, 1906 " " *for copy Faria pat*

Claims 2 to 5 are rejected on Faria above cited or on Pomarède
in view of

0 Hatchett, 898,642, Sept. 15, 1903,

0 Anet, 573,071, Dec. 15, 1896,

(82-1)

0 Chisholm, 891,253, June 23, 1908

There is held to be no invention in transmitting the energy of the
sound waves from the phonograph to the horn electrically instead of
by tubes as shown in Pomarède.

D.G.H.

Examiner.

Completed

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
APPARATUS FOR REPRODUCING)
MOTION AND SOUNDS) Room No. 312
Filed March 23, 1908,)
Serial No. 422,650.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of June 21, 1910, please amend the above entitled case as follows:

In line 12, page 7, cancel "an air current" and insert in place thereof a current of air or other fluid.

In line 9, claim 5, after "receiver" insert having an air or fluid reproducer connected therewith - .

Cancel claims 1 to 4 inclusive and change the numeral of claim 5 to 1.

Add the following claims:

2. In devices of the class described, the combination of a kinetoscope, a combined phonograph and telephone transmitter closely adjacent thereto and comprising a diaphragm, means for vibrating the same in accordance with sound vibrations, means for impressing corresponding undulations thereby on an electric circuit, said circuit, driving mechanism for the kinetoscope and phonograph, a receiver in said circuit, and an air or fluid

reproducer connected with said receiver, substantially as set forth.

3. In devices of the class described, the combination of a kinoscope, a combined phonograph and telephone transmitter closely adjacent thereto and comprising a diaphragm, means for vibrating the same in accordance with sound vibrations, means for impressing corresponding undulations thereby on an electric circuit, said circuit, driving means for the kinoscope and the phonograph, a motograph in said circuit, means for operating the same, and an air or fluid reproducer operated by said motograph, substantially as set forth.

4. In devices of the class described, the combination of a kinoscope, a combined phonograph and telephone transmitter closely adjacent thereto and comprising a diaphragm, means for vibrating the same in accordance with sound vibrations, means for impressing corresponding undulations thereby on an electric circuit, said circuit, driving mechanism for the kinoscope and phonograph, a rotating chalk cylinder and a friction member resting in contact with the same in said circuit, and an air or fluid reproducer comprising a valve connected to said friction member, substantially as set forth.

R E M A R K S .

Reconsideration and allowance of the claims as now presented are respectfully requested.

The applicant has found that in combined devices of the class specified, an electrical telephone receiver,

such as shown in the French patent to Faria, produces a tone which is so unnatural and indistinct as to be highly detrimental to a realistic reproduction. By combining an air reproducer with the receiving means as specified in the claims, this objection is obviated. It is, therefore, thought that the broad combination as specified in claim 2 and the more specific combinations specified in claims 1, 3 and 4 are not only novel but also patentable.

Respectfully submitted,

THOMAS A. EDISON,

Orange, New Jersey,

June 5th 1911.

By

Charles W. Dyer

His Attorney.

Div. 7. Room 312

Address only
"The Commissioner of Patents,
Washington, D. C."

2-280

Paper No. 7

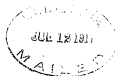
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

GEN.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON July 12, 1911.

Thomas A. Edison,
c/o Frank L. Dyer,
Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

for Apparatus for Reproducing Motions and Sounds, filed March 23,
1908, Serial No. 422,650.

E. B. Moore

Commissioner of Patents.

Case reconsidered as amended June 6, 1911.

All the claims are rejected. The combination of a kinetoscope and a phonograph mechanically connected together and horns adjacent the screen, with one type of sound-transmitting apparatus being old (as shown by De Faria or Pomaredde of record), no invention is involved in combining the first named apparatus with another type of sound-transmitting mechanism whether the second sound-transmitting mechanism be new or old, since each element act in its own way in the combination irrespective of the other. Applicant, in changing the sound-transmitting mechanism or the type of phonograph, has merely altered one element of an old combination and has not produced a new combination. In re Mc Neil 100 O. G. 2178.

Examiner.

258

Don't file

APPLICANT: THOMAS ALVA EDISON, A CITIZEN OF THE UNITED
STATES, RESIDING AT LLEVELLYN PARK, ORANGE,
COUNTY OF ESSEX, STATE OF NEW JERSEY, U.S.A..
INVENTOR:

TITLE: APPARATUS FOR REPRODUCING MOTION AND SOUND.

In my application, filed concurrently herewith, I have shown and described an apparatus and process for recording motion and sounds simultaneously by means of a moving picture camera and a recording phonograph, and for reproducing the motion and sounds so recorded by means of a moving picture projecting machine, wherein is exhibited a positive film formed from the negative, and a reproducing phonograph, a simple form of mechanical actuating mechanism being provided for driving both the phonograph and the camera, during the performance of the act or scene, and the same or a precisely similar form of driving mechanism being made use of to operate the moving picture projecting machine and the reproducing phonograph during the reproduction of the sound and motions which had previously been recorded. I have found that it is essential to the successful operation of these devices in unison that a simple form of mechanical driving means, common to both the machines, be provided, other arrangements for effecting the synchronous operation of these instruments, such, for example, as synchronous electric motors operating at a distance from one another,

being too complicated, expensive and generally unreliable to secure successful and practical results. In the practical operation of such devices, however, in theatres or other large buildings at a distance from the studio where the sounds and motions were originally recorded, it is impracticable to extend an ordinary form of mechanical drive, such, for instance, as a shaft used for driving both devices, from the neighborhood of the moving picture projecting machine to the neighborhood of the reproducing phonograph, when the latter is placed behind or near the screen whereon the pictures are being exhibited.

The object of the present invention is to provide an apparatus whereby the projecting machine used for projecting moving pictures, and the reproducing phonograph, which is used for reproducing the sounds originally recorded synchronously with the making of the pictures upon the moving picture film, may be placed in convenient adjacent relation to one another, and operated from a simple form of mechanical actuating means common to both, and the sounds which have been recorded upon the phonograph may be reproduced in the immediate neighborhood of the screen upon which the pictures are thrown, so that the sounds shall appear to emanate from the screen, although the phonograph is situated in the immediate neighborhood of the projecting machine and at a considerable distance from the screen.

Within the scope of my invention, I may make use of a variety of means for transmitting the vibrations imparted to the stylus of the phonograph by the phonograph record, to the neighborhood of the screen and thereat reproducing the sounds originally recorded upon the record, The preferable means which I employ for this purpose, com-

prises a telephone circuit whereon is impressed an electric current varying in strength in correspondence with the vibrations imparted to the phonograph stylus as it traverses the phonograph record, and means in the neighborhood of the screen for transforming the undulations of the electric current into amplified atmospheric vibrations.

In order that my invention may be better understood, attention is directed to the accompanying drawing, wherein Figure 1 is a diagrammatic view showing the preferred relative arrangement of the kinetoscope, phonograph, and loud speaking telephone; Figure 2, is a diagrammatic view, partly in cross-section, showing the transmitting mechanism and one form of receiving mechanism, and Figure 3 is a view similar to Figure 2, but showing a modified form of sound amplifying receiving mechanism. In all of the Figures of the drawings, the same reference numerals are used to indicate the same parts.

Referring to Figure 1, reference numeral 1 indicates a portable stand on which the kinetoscope 2 and the phonograph 3 are mounted, the phonograph preferably being firmly secured to the stand, as for example, by means of screws. The form of this stand may be varied to adapt it to be placed in the locations provided for kinetoscopes in theatres and the like, which are sometimes difficult of access and require stands specially constructed for the particular location. Common driving means for the phonograph and kinetoscope is provided, in the illustration one of these machines being shown as being driven from the other through a belt or sprocket chain 4. It is evident, of course, that with the machines connected up in this way, the kinetoscope may be driven from the phonograph motor

or the phonograph may be driven from the kinetoscope or the two machines may be separately connected to a single source of power, it being important only that a simple form of mechanical driving means be employed, common to both machines. 5 indicates a screen whereon the picture is thrown by the kinetoscope, and 6 the receiving apparatus, by which the sound is audibly reproduced in the neighborhood of and preferably behind the screen whereon the motion pictures are displayed. By the employment of a sound amplifying receiver or by providing a separate sound amplifier, the sounds may be given sufficient strength and volume to carry to every part of the building. A transmitter 7 replaces the reproducer ordinarily used upon the phonograph, a circuit connecting the transmitter and receiver shown at 7. By arranging the kinetoscope and phonograph in fixed relation to one another and preferably upon a single stand, and establishing connections between the transmitter on the phonograph and the receiver, by means of a flexible conductor, it will be apparent that the stand bearing the kinetoscope and phonograph can be placed in whatever position is most convenient and the sounds made to emanate from the neighborhood of the screen, and at the same time the kinetoscope and the phonograph may be driven by a simple mechanical form of actuating means, which is necessary in order to successfully maintain the synchronism between the moving film and the rotating record necessary to reproduce the sounds and motions in the precise relations which existed between them when the act or scene was performed.

It is understood that the record and negative are formed simultaneously. This may be done, for example, by

the process and with the apparatus set out in my earlier application above referred to. The gearing used to operate the two machines during the reproduction of sounds and motions, is so proportioned as to rotate the machines at precisely the same relative speed as existed between the corresponding machines during the process of recording, so that when the two machines have once been set into operation the film and record in the precise relation existing between them during the original performance of the act or scene, this identical relation will be maintained throughout the exhibition and reproduction. Means for simultaneously setting the devices into operation in the said relation is disclosed in my earlier application already referred to and such means while it may be made use of in connection with apparatus of the present invention, forms no part hereof.

The telephone transmitter shown in Figure 2 is a magneto transmitter provided with a diaphragm 9, having a phonographic stylus operatively connected thereto, this entire device being used to replace the ordinary reproducer of the phonograph. The diaphragm 9 thus serves both as the diaphragm of a phonograph reproducer and as the diaphragm of the transmitter 7. To the diaphragm 9 of the transmitter a stylus lever 10 is connected by means of a link 11, the stylus lever being pivoted on the floating weight 12, and bearing the stylus or reproducing point or ball 13. This method of pivoting the stylus lever, which is common in phonographs, makes it possible for the stylus to adjust itself to any eccentricities or other considerable variations in the record and to truly follow the record groove. The vibrations of the stylus 13 cause

similar vibrations in the diaphragm 2, which acts to impress undulating currents of electricity upon the circuit 2, as in any ordinary telephone transmitter. This circuit 2 is connected with a suitable telephone receiver which may be of the ordinary type, or it may be of the motograph or loud speaking telephone type. In either case the receiver may be supplemented in its action by means of a sound amplifying mechanism if loud sounds are desired to be produced.

In Figure 2 I have illustrated a receiver of the motograph type, the chalk cylinder 14 of the motograph being connected with one branch of the circuit 2, while the electrode or pen 15 of the motograph, as it is commonly called, is connected with the other branch of the circuit. As is well known, the motograph, which is of my invention and which is described in United States Letters Patent, No. 221,657, dated November 25, 1879, is operated by variations in friction produced by the passage of electric currents of varying strength from the pen or electrode into the constantly rotating chalk cylinder 14, the degree of pressure between these parts being regulated by means of a screw or equivalent device 16, and the vibrations produced being transmitted to a diaphragm 17, which sets up vibrations in the atmosphere corresponding to those impressed upon the electric current at the transmitter, and these vibrations may be further amplified by means of a horn 18 (See Fig. 1).

In Figure 3, I have shown a receiver having operatively connected therewith a sound amplifying mechanism whereby the sounds transmitted may be very greatly amplified. The chalk receiver is shown in this figure as a

means of transforming the undulations of the electric current into mechanical vibrations, but it is understood, of course, that any form of telephone receiver could be substituted for that shown. The vibrations of the pen or electrode 15 (when the chalk receiver is used for the purpose of receiving the sounds) are communicated to an amplifying sound producing mechanism. I may make use of any known form of amplifying mechanism for this purpose, such, for example, as those which are operated by friction, but for the purposes of illustration I have shown the pen or electrode connected to the valve 10 of an amplifying reproducer which is operated by means of an air current. This reproducer is preferably of the form shown and described in the application of Alexander N. Pierman, Serial No. 307,324, filed March 27, 1906, and is preferably operated by suction, a current of air being drawn through the aperture 20 in the side of the reproducer, it being understood that fluid pressure instead of suction may be made use of, in which case it will be necessary to reverse the relative positions of the valve 10 and its seat. This amplifying reproducer, however, is no part of my invention, it being understood that this device or any other equivalent device may be made use of for this purpose.

The operation of the devices which have been described is as follows:- A positive moving picture film is placed in the kinetoscope and a phonograph record is placed upon the mandrel of the phonograph, the positive film being made from a negative which was taken simultaneously with the production of the phonograph record or the master record of which such record is a duplicate. The mechanism is set into operation and the motion picture is displayed upon the screen by the kinetoscope, and at the same time

the sounds originally produced simultaneously with the making of the picture are reproduced behind the screen or in its immediate neighborhood by means of the telephone receiver and sound amplifier. The production of the sounds is caused by the phonograph stylus, vibrated from the phonograph record, imparting its vibrations to the diaphragm 2, and the vibrations of this diaphragm impresses entirely corresponding undulations of the electric current upon the circuit 3, which undulations are transformed into mechanical vibrations by means of the telephone receiver, the mechanical vibrations set up being imparted directly to a diaphragm whereby sound waves are set up in the atmosphere, or else the mechanical vibrations are imparted to an amplifying device which causes sound vibrations of great force to be set up in the atmosphere.

Dyke:-

This patent shows a
Recording apparatus similar
to Edison's Reproducing apparatus

Will you look it over?

Levin

Just to

claims notwithstanding us
may have to swear back
of it. Order copy for file
of files 394 Dyke

Folio No. 443

Serial No. 436,104

Applicant.

Address.

Thomas Alva Edison

Orange, N.J.

Title

Water-Proofing Fabric and Fabric ^{com. of bags}

Filed

June 1, 1908

Examiner's Room No. _____

Assignee

North Jersey Paint Co.

Ass't Exec.

Nov 2, 1908 Recorded Nov 3, 1908 Liber 2, 80 Page 6

Patent No. 909,168

Issued

Jan 12, 1909

ACTIONS.

- | | | |
|----|--------------------------------------|----|
| 1 | <u>Rejected July 6, 1908</u> | 16 |
| 2 | <u>Amended July 31, 1908</u> | 17 |
| 3 | <u>Rejected Oct 5, 1908</u> | 18 |
| 4 | <u>Amended Oct 27, 1908</u> | 19 |
| 5 | <u>Letter of Inquiry Dec 3, 1908</u> | 20 |
| 6 | <u>Allowed Dec 4, 1908</u> | 21 |
| 7 | <u>Final Fee due June 4, 1909</u> | 22 |
| 8 | <u>Final fee paid Dec 1st 1908</u> | 23 |
| 9 | | 24 |
| 10 | | 25 |
| 11 | | 26 |
| 12 | | 27 |
| 13 | | 28 |
| 14 | | 29 |
| 15 | | 30 |

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Waterproofing bags for Portland Cement

Especially valuable for shipping
Cement for Export.

The ~~residue~~ residuum which settles
out of Crude petroleum when stored
in tanks, ~~is~~ which at ordinary
temperatures is a solid is used to
impregnate the bag. This residuum is
known in the ^{refining} trade as BB.

The residuum is dissolved in warm
Petroleum benzine & allowed to cool,
and then remains ^{or the} quiet until insoluble
material settles out. ^{or it can be filtered,} the clear solution
is drawn off & put into a still &
the Benzine distilled off to a point
where the residuum is just semi-solid

2
at ordinary temperatures.

This material is then melted
by steam coils until it is as
liquid as water & above 212° F.,
into this the bag is ~~then~~ immersed
until the water of the fibre is
eliminated as gas. The bag
is taken out & when cool is
ready for use.

A cheaper method can be used
where the waterproofing is not
required to be so perfect.
In this case the BB residuum
is melted ~~the~~ & a little
Benzine added to cause it to
have the right consistency for
dipping the bag. ~~It~~ In this
case the solid material originally in
the BB is not eliminated & causes
the waterproofing to be a little
inferior to the BB from which

it has been demonstrated by
solution settling or filtering

The bag after water proofing
is flexible, will not crack
before it is worn out, does not
effect materially the strength
of the bag + being very cheap
is of very great utility in
connection with the shipment
of a material very sensitive
to moisture like Portland
Cement,

Claim New get into for a bag
water proofed by impregnating it with
the residue of ^{poly}ethylene known
as P.B.
+ roller claim

Folio No. 417

Serial No. 437,845

Applicant.

Thos. A. Edison

Address.

Orange N.J.

Title Device for feeding pulverulent material

Filed June 11, 1908

Examiner's Room No. 232

Assignee Thomas A. Edison, Inc.

Ass't Exec. June 30, 1908 Recorded July 7, 1908 Liber 5127 Page 50

Patent No. 993,294 Issued May 23, 1911

ACTIONS.

- | | | | |
|----|-----------|----------------|----|
| 1 | Rejection | Sept 12, 1908 | 16 |
| 2 | Amended | Sept 8, 1909 | 17 |
| 3 | Rejection | Oct 13, 1909 | 18 |
| 4 | Amended | Oct 8, 1910 | 19 |
| 5 | Amended | Nov 21, 1910 | 20 |
| 6 | | | 21 |
| 7 | Paid | April 21, 1911 | 22 |
| 8 | | | 23 |
| 9 | | | 24 |
| 10 | | | 25 |
| 11 | | | 26 |
| 12 | | | 27 |
| 13 | | | 28 |
| 14 | | | 29 |
| 15 | | | 30 |

FRANK L. DYER,
Counsel,

ORANGE, NEW JERSEY.



HUBERT H. CHAPMAN, PRESIDENT
W. B. BEAUCHAMP, VICE-PRESIDENT
THOMAS A. EDISON, GEN'L. MANAGER
WILLIAM D. THOMAS, SECRETARY
E. P. MILLER, TREASURER

TRADE MARK
Thomas A. Edison

The Edison Portland Cement Co.

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS, STEWARTSVILLE, N. J.

SALES OFFICES:

PHILADELPHIA, PA., Arcade Building
NEW YORK, N. Y., St. James Building
PITTSBURGH, PA., Machinery Building
NEWARK, N. J., Union Building
BOSTON, MASS., Post Office Square Bldg.
SAVANNAH, GA., National Bank Building

April 23, 1908.

Mr. Frank L. Dyer,
Edison Laboratory,
Orange, N. J.

Dyer see me
E

Dear Mr. Dyer:

I beg herewith to hand you a letter from Mr. Mason enclosing a sketch of the new chalk feed which we are now using on our kilns and which is a very great success. I suggest that you take this matter up immediately with Mr. Edison and arrange to have it patented, if possible, as it is undoubtedly the greatest advance we have made in our kiln practice in a long time, the output from the same kiln being increased very materially. For instance, Kiln No. 5, on which this device is working, in 13 days made 10,784 barrels, while Kiln No. 6, which is working with the old feed, but all other conditions the same, made 7,380 barrels for the same period, so you see that it is a matter of very great importance, as it materially increases outputs and we believe will also very much reduce the fuel consumption per barrel. We are having the test made and can send you this information in a few days.

Yours very truly,

Wm. A. Edison
W. A.

WSM-RBS



The Edison Portland Cement Co.

ROBERT H. THOMPSON, PRESIDENT
W. S. MALLORY, VICE-PRESIDENT
THOMAS A. EDISON, TRUSTEES
WILLIAM F. FERGUSON, SECRETARY
H. F. MILLER, TREASURER

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS, STEWARTSVILLE, N. J.

SALES OFFICES:

PHILADELPHIA, PA.,	Arcade Building
NEW YORK, N. Y.,	St. James Building
PITTSBURGH, PA.,	Machine Building
RESCUE, N. Y.,	Union Building
BOSTON, MASS.,	Post Office Square Bldg.
SEVASTOPOL, CR.	National Bank Building

April 21, 1908.

Mr. W. S. Mallory,
Vice President

Dear Sir:

Enclosed is a sketch showing the new chalk feed that we are now using on our kilns. So far by tests on one kiln this increases the output from 20 to 30%, on account of it feeding very regularly. This in my opinion is due to two reasons:

- 1st: The five screws feeding from different parts of the bin causes the chalk to settle down gradually over the entire bin and thus we avoid the formation of arches and holes in the chalk which avalanches and cause the chalk to run more freely which makes the feed irregular
- 2nd: If one screw should fail to feed for a time, it would affect the output only 20%, while with one screw acting as a feed the output would be affected 100% in case of any trouble

As near as I can find out, all cement mills use a single screw in the bottom of the raw material bins, and they all feed irregularly. An irregular feed of course makes the kiln more difficult to handle and we believe causes an excess of fuel to be burned to take care of these irregularities. You will note that this feed is driven from an idler of the kiln. This is done so that

WSM. . . 2. 4/21/08

when the kiln is slowed down to increase the heat for a few moments, the amount of chalk going into the kiln is proportionate. You will note that the screws are partially covered inside the bin so they will feed from certain points only. By this means as stated above, the chalk settles down over the full area of the bin.

Yours very truly,

WSM-CRM

Enclosure

W. H. Massey
Sup't



This takes pressure
off the screw of
the large Calumet
before, above
at same time
the screw only gets
a partial of not a
full load -

Hepp

parallel

(1) bin or hopper + plurality of feed chutes
~~out~~ (in divergential planes) and
discharging into a common trunk

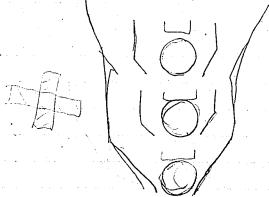
(2) do + a support above the chutes

(3) the connector or support

(4) 1 + a screw at bottom of
said trunk

(5) 1 + rotary device +
having connection between same
and said screws

(6) + main screws



Folio No. 527

Serial No. 437.515

Applicant.

Address.

William L. Edison

Title Spark Plugs

Filed June 9, 1908

Examiner's Room No. 552 63

Assignee

Ass'g't Exec.

Recorded

Liber

Page

Patent No. 1,081,728 Issued December 16, 1913

ACTIONS.

- | | |
|-------------------------------|---------------------------------|
| 1 Rejection June 27, 1908 | 16 Final fee due March 15, 1914 |
| 2 Answer July 27, 1908 | 17 Final fee paid Nov. 19, 1913 |
| 3 Rejection Sept. 19, 1908 | 18 |
| 4 Amended Sept. 15, 1909 | 19 |
| 5 Rejected Oct. 21, 1909 | 20 Patent 1,081,728 handed |
| 6 Amended October 19, 1910 | 21 to Wm L. Edison by |
| 7 Office letter Nov. 18, 1910 | 22 Mr. Hardy 12/6/13 |
| 8 Amended Nov. 22, 1910 | 23 |
| 9 Letter Dec. 9, 1910 | 24 |
| 10 Amended Dec. 6, 1910 | 25 |
| 11 Rejected Dec. 15, 1911 | 26 |
| 12 Amended Dec. 12, 1912 | 27 |
| 13 Rejected April 28, 1913 | 28 |
| 14 Amended May 10, 1913 | 29 |
| 15 Allowed Sept. 15, 1913 | 30 |

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

1081728

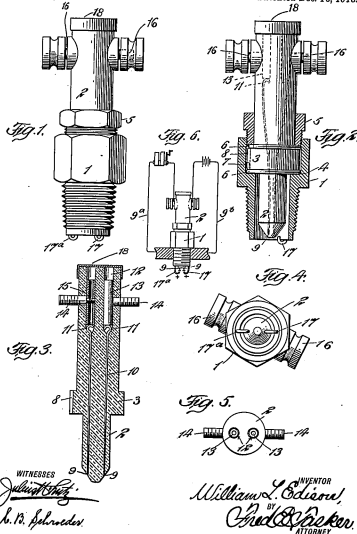
July 527

make place for

W. L. EDISON.
SPARK PLUG.
APPLICATION FILED JUNE 2, 1908.

1,081,728.

Patented Dec. 16, 1913.



EDISON PATENT OFFICE, NEWARK, N. J.

UNITED STATES PATENT OFFICE.

WILLIAM L. EDISON, OF ORANGE, NEW JERSEY.

SPARK-PLUG.

1,081,728.

Specification of Letters Patent.

Patented Dec. 16, 1913.

Application filed June 2, 1908. Serial No. 42741A.

To all whom it may concern:

Be it known that I, WILLIAM L. EDISON, a citizen of the United States of America, residing at Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a spark-plug of the jump-spark class for internal combustion engines, my object being to extend the conductors through the core of porcelain, or other insulating material, in such a manner that the core will not be weakened as much as usual, and will be much less liable to break.

With this and other objects in view my invention consists in the peculiarities hereinafter more fully described and claimed. Referring to the accompanying drawings, Figure 1 represents a longitudinal elevation of my complete spark plug. Fig. 2, a similar view partly in section. Fig. 3, a longitudinal section. Fig. 4, an end view, Fig. 5, an end view of the opposite or outer end of the plug, with the cap removed, and Fig. 6, a diagrammatic view.

Each of the two electrical conductors, together with the external connectors and the spark gaps, are constructed exactly alike, and a description of one will apply to both. The reference numeral 1 indicates an ordinary spark plug housing provided with tapering threads adapted to screw into the cylinder head of a gas engine. 2 is an elongated core composed, preferably, of porcelain, although it might be made of mica or glass. This core has a central circular enlargement 3 adapted to enter the housing and to be clamped between a shoulder 4 and the end of a locking sleeve 5 screwed into the housing and surrounding the core. Suitable washers 6 are interposed between the parts to make a gas-tight joint and prevent leakage under pressure of the sleeve.

7 represents a short aligning pin fixed to the inside of the housing 1 and adapted to enter an open slot 8 extending across the side of the circular enlargement 3 whereby the core is retained in its proper alignment and whereby the spark-gap terminals are always brought opposite each other in the act of assembling the parts.

Two separate and independent electrical

circuits 9* and 9', Fig. 6, extend longitudinally through the core 2 of the plug, each consisting of a conductor 10, such as an ordinary wire of any proper material, tapered down and secured in any suitable manner to an exceedingly fine gage sparking terminal 3. The conductor 10 may be either integral or fused with the reduced terminal. The purpose of thus reducing the terminal 35 down to the thread-like gage is to choke or intensify the current at the spark gap, and thereby produce a stronger spark which will be more potent in igniting the gases in the cylinder of an internal combustion engine, and particularly so when the gas is under extremely high compression. Said terminal is, preferably, composed of platinum, or any other good conductor capable of resisting the disintegrating effects of intense heat, and its extreme outer end lies flush with the sparking or smaller end of the plug, in contradistinction to those spark gap terminals or points which project a short distance beyond the end of the plug. 40 The conductor 10 extends longitudinally through the core of the plug in a slightly torsional or spiral line for the purpose of avoiding as much as possible the more weakening effect of running these two conductors in straight parallel lines, for it is desirable to maintain as much strength as possible in the core, owing to its susceptibility to breakage from vibration. The upper end of each conductor 10 terminates in a head 50 11 which sits in the lower end of a longitudinal hole 12 in which is located a tubular electrical conductor 13 connected with a lateral extending stem of a binding screw 14. This stem is connected to the tubular conductor by a screw 15. The screw 15, its outer end being provided with the usual binding screw 16.

As already stated, the inner or sparking end of the core 2 is conical and the reduced vice terminal 3 emerges from the opposite sides of the inclined wall thereof at a point about half way between the apex and the base of the cone, thereby separating the two terminals sufficiently to bring them opposite or under two internal hook-shaped terminals or sparking points 17 and 17'. These points are set in the ends of the housing 1 in the old and well known manner, so that the current will jump from the terminals 3 to the terminals 17 and 17' whenever the circuits are completed. It will be seen that

this location of the two terminals 9 in relation to each other allows the outer end of the conical portion of the core 2 to come between the terminals and thereby assist in preventing the establishment of a short circuit. The fine wire terminals or electrodes 9 are laced in the porcelain in order to perfectly insulate them as well as to more efficiently prevent the escape of gas back through the plug. I have found in practice that the fine wire conductors will condense the current and produce a much more effective spark for igniting gas under high compression than if they were made of the full-sized wires heretofore employed.

The bore of the bushing 1 is considerably larger than the diameter of the core 2, in order to leave a surrounding chamber for the free circulation of the gases during explosion to break up the accumulation of soot that might otherwise collect to short circuit the spark gap.

18 represents a cap which fits over the top of the plug in order to give it a neat appearance and protect the connections.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a spark plug, the combination of a non-conducting core having a conical sparking end and a pair of electrical conductors insulated from each other and passing longitudinally through the core, said conductors terminating flush with the conical surface of said sparking end on opposite sides of the apex of the cone, substantially as described.

2. In a spark plug, the combination of a non-conducting core having a conical sparking end, a pair of conductors, insulated from each other, and passing longitudinally through the core, and a fine gage sparking terminal secured to the end of each conductor, said terminals terminating flush with the conical surface of said sparking end on opposite sides of the apex of the cone, substantially as described.

3. In a spark plug, the combination of a non-conducting core having a conical sparking end, a pair of conductors, insulated from each other, and passing longitudinally through the core, and a fine gage sparking terminal secured to the end of each con-

ductor, said terminals terminating flush with the conical surface of said sparking end on opposite sides of the apex of the cone, and said terminals being laced in the core, a conducting bushing surrounding said core, and spark terminals carried by said bushing and co-operating with said first mentioned terminals to form spark gaps, substantially as described.

4. In a spark plug, the combination of a non-conducting core having a conical sparking end and a pair of electrical conductors insulated from each other and passing longitudinally through the core, said conductors terminating flush with the conical surface of said sparking end on opposite sides of the apex of the cone, a conducting bushing surrounding said core, and a pair of sparking terminals carried by said bushing adapted to co-operate with the terminals of the electrical conductors of the core to form a pair of spark gaps, said core and bushing being provided with co-operating means which upon the assembling of the core and bushing insures that said terminals will always be brought into the same relative and correct positions to form said spark gaps, substantially as described.

5. In a spark plug, the combination of a non-conducting core having a conical sparking end, a pair of conductors insulated from each other and passing longitudinally through the core, a fine gage sparking terminal secured to the end of each conductor, said terminals terminating flush with the conical surface of said sparking end on opposite sides of the apex of the cone, a conducting bushing surrounding the said core, and sparking terminals carried by said bushing and co-operating with said first mentioned terminals to form spark gaps, said core and bushing being provided with co-operating means which upon the assembling of the core and bushing insures that said terminals will always be brought into the same relative and correct positions to form said spark gaps, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM L. EDISON.

Witnesses:
RRESA G. DuBois,
C. B. SCHROEDER.

This invention relates to a spark plug of the jump spark class for internal combustion engines, my object being to provide a plug by means of which two entirely separate and independent electrical systems or circuits may be employed either alternately or simultaneously, for producing one or two sparks whereby the plug may be connected separately or together with a battery or with a magneto. A further object of my invention is the provision of means for producing a more effective spark, and thereby attaining better ignition under higher compression than has hitherto been accomplished. With these and other objects in view, my invention consists in the peculiar features and combinations of parts more fully described hereinafter and pointed out in the claims.

Referring to the accompanying drawings,

Figure 1 represents a longitudinal elevation of my complete spark plug.

Figure 2, a similar view partly in section.

Figure 3, a longitudinal section.

Figure 4, an end view.

Figure 5, an end view of the opposite or outer end of the plug, with the cap removed, and

Figure 6, a diagrammatic view.

Each of the two electrical conductors, together with the external connectors and the spark gaps, are constructed exactly alike, and a description of one will apply to both. The reference numeral 1 indicates an ordinary spark plug bushing provided with tapering threads adapted to screw into the cylinder head of a gas engine. 2 is an elongated core composed, preferably, of porcelain, although it might be made of mica or glass. This core has a central circular enlargement 3 adapted to enter the bushing and to be

clamped between a shoulder 4 and the end of a locking sleeve 5 screwed into the bushing and surrounding the core. Suitable washers 6 are interposed between the parts to make a gas-tight joint and prevent breakage under pressure of the sleeve. 7 represents a short aligning pin fixed to the inside of the bushing 1 and adapted to enter an open slot 8 extending across the side of the circular enlargement 3 whereby the core is retained in its proper alignment and whereby the spark-gap terminals are always brought opposite each other in the act of assembling the parts. Two separate and independent electrical circuits 9a and 9b, Figure 6, extend longitudinally through the core 2 of the plug, each consisting of a conductor 10, such as an ordinary wire of any proper material, tapered down and secured in any suitable manner to an exceedingly fine gauge sparking terminal 9. The conductor 10 may be either integral or fused with the reduced terminal. The purpose of thus reducing the terminal down to the thread-like gauge is to choke or intensify the current at the spark gap, and thereby produce a stronger spark which will be more potential in igniting the gases in the cylinder of an internal combustion engine, and particularly so when the gas is under extremely high compression. Said terminal is, preferably, composed of platinum, or any other good conductor capable of resisting the disintegrating effects of intense heat, and its extreme outer end lies flush with the sparking or smaller end of the plug, in contradistinction to those spark gap terminals or points which project a short distance beyond the end of the plug. The conductor 10 extends longitudinally through the core of the plug in a slightly torsional or spiral line for the purpose of avoiding as much as possi-

ble the more weakening effect of running these two conductors in straight parallel lines, for it is desirable to maintain as much strength as possible in the core, owing to its susceptibility to breakage from vibration. The upper end of each conductor 10 terminates in a head 11 which sets in the lower end of a longitudinal hole 12 in which is located a tubular electrical conductor 13 connected with a lateral extending stem of a binding screw 14. This stem is connected to the tubular conductor by a screw connection 15 on the inside, its outer end being provided with the usual binding screw 16. As already stated, the inner or sparking end of the core 2 is conical and the reduced wire terminals 9 emerge from the opposite sides of the inclined wall thereof at a point about half way between the apex and the base of the cone, thereby separating the two terminals sufficiently to bring them opposite or under two ^{turned up}inturned hook-shaped terminals or sparking points 17. These points are set in the ends of the bushing 1 in the old and well known manner, so that the current will jump from the terminals 9 to the terminal 17 whenever ^{and the circuit is}a circuit is completed. It will be seen that this location of the two terminals 9 in relation to each other allows the outer end of the conical portion of the core 2 to come between the terminals and thereby assist in preventing the establishment of a short circuit. The fine wire terminals or electrodes 9 are baked in the porcelain in order to perfectly insulate them as well as to more efficiently prevent the escape of gas back through the plug. I have found in practice that the fine wire conductors will condense the current and produce a much more effective spark for igniting gas under high compression than if they were made of

the full-sized wires heretofore employed. The bore of the bushing 1 is considerably larger than the diameter of the core 2, in order to leave a surrounding chamber for the free circulation of the gases during explosion to break up the accumulation of soot that might otherwise collect to short circuit the spark gap. 18 represents a cap which fits over the top of the plug in order to give it a neat appearance and protect the connections. 2 1/2"

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A spark plug having a central core composed of insulating material, and a surrounding bushing and sleeve for holding said core, in combination with two longitudinal independent electrical conductors extending through the plug and terminating at the inner end of said core.

2. A spark plug provided with a core containing two longitudinal electrical circuits, in combination with two terminals at the opposite ends of said core, and a bushing provided with electrodes adapted to co-operate with the terminals of said circuits.

3. A spark plug provided with a core containing two independent electrical circuits, in combination with a pair of terminals arranged and adapted to provide two spark gaps working independently of each other.

4. A spark plug provided with two independent electrical circuits and two spark gaps.

5. A spark plug provided with two independent electrical circuits spirally arranged within the core of the plug.

6. A spark plug provided with a core of non-conducting material, in combination with a spiral conductor extending through the core.

7. A spark plug having a core containing two independent circuits, in combination with two independent terminals at one end of the core and two spark-gaps at the opposite end thereof.

8. A spark plug provided with the usual non-conducting core and conducting bushing, in combination with spark-gap terminals comprising a fine wire terminal located in the core.

9. A spark plug having a core composed of non-conducting or insulating material containing an electrical circuit composed of conductors having different gauges.

10. A spark plug having a core containing an electrical circuit provided with a spark-gap terminal of fine gauge, internally connected with a conductor of larger gauge.

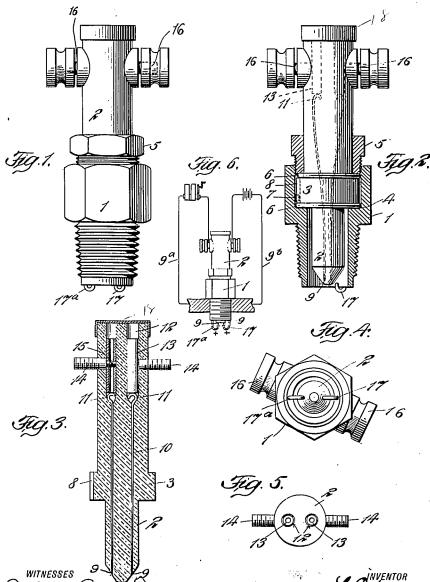
11. A spark plug provided with spark-gap terminals composed of conductors of different gauges.

met

103-109

437,515-

241
23



WITNESSES
Julius C. [Signature]
S. C. [Signature]

INVENTOR
William L. Edison,
BY
Frederick [Signature]
ATTORNEY

Div. 28 Room 392
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-260.

Paper No. 1
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

RYH

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

June 27, 1908.

William L. Edison,
c/o Fred E. Tasker,
50 Church St., New York, N. Y.



Please find below a communication from the EXAMINER in charge of your application,
S. No. 437,515, filed June 9, 1908, Spark Plugs.

E. B. Moore
Commissioner of Patents.

This case has been examined.

Page 2, line 12, numerals 9^a and 9^b are not on the drawings.

Page 3, line 11, numeral 16' is not on the drawings.

Claims 1 to 7, inclusive, define nothing patentable over the
following references, and are rejected:

British Patent to Sharp, 3402 of 1906

French Patent to Sharp, 364,298

(123-169)

Claims 8 to 11, inclusive, are rejected on

French Patent to Jeffery, 376,219 (123-169).

See also

German Patent to Veigel, 192,650 (123-169),

showing an alining means.

*Complete
filed about Aug. 13/06 - ?
reentered Dec. 6/06 - ?
discovered May 26/06 - public
Aug 16/06 -*

Further patented Jan 4/07

pub. Dec 12/07.

WFM

Examiner.

Room 382,
Application, William L. Edison,
Serial No. 437,815,
Filed June 9, 1908,
Spark Plugs.

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

Office letter of June 27, 1908, received
and considered, and further action on the case is re-
quested in view of the following amendments and remarks.

A M E N D M E N T S.

Erase the statement of invention comprising lines
1 to 14 inclusive, and substitute the following:

"This invention relates to a spark-plug of the jump-
spark class for internal combustion engines, my object
being to extend the conductors through the core of porce-
lain, or other insulating material, in such a manner
that the core will not be weakened as much as usual, and
will be much less liable to break.

"With this and other objects in view my invention
consists in the peculiarities hereinafter more fully
described and claimed."

Erase all the claims, excepting 5 and 6, and sub-
stitute the following:

3. A spark plug having the usual non-conducting
core and conducting bushing, in combination with an
electrical conductor passing longitudinally through the
core and tapering gradually as it extends toward the
spark gap.

New York City, July 27, 1908.

Div. 2 Room 302
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

U. S. P. O.

Patent No. 4
All communications respecting this
application should give the serial number,
date of filing, and title of the invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.

Sept. 29, 1908.

William L. Wilson,

c/o John S. Barker,

Curry House, Washington, D. C.

~~Please send Patent Application from the EXAMINER in duplicate of your contribution.~~

S. No. 437,645, filed June 19, 1906, Serial: 11948.

Examiner

Transmission of Patent

Page 2, line 12, numerals 9^a and 9^b are not on the drawings.

Page 5, line 11, numeral 15 is not on the drawings.

Class 1, line 2, "circuits" should be ~~introduced~~

Claims 1 and 2 are rejected as covering nothing patentable
over the British patent to Sharpe of record. In this patent, the
electrodes in the core are bent, and unless the so-called optical
conductors in the core of the applicant's plug give a new result,
this claim cannot be allowed.

Claims 1 and 2 are also rejected on
2,403,338
889,433, ~~Sept. 2, 1908~~ (189-169),

showing electrodes which are arranged at an angle to each
other, and to connect or bend these electrodes in any manner described
is not thought to be patentable.

Claim 3 is rejected on Jeffery of record. To taper the elec-
trode shown in Fig. 1 is the equivalent of reducing it to the
normal shape.

Claim 5 is also rejected on
741,684
441,904, Lehman, Oct. 20, 1905
Wilson Patent to Sander, 2,357

(123-169).

FRED. E. TASKER,
COUNSELLOR AT LAW.
PATENT LAW EXCLUSIVELY.
HUDSON TERMINAL,
80 CHURCH STREET,
NEW YORK.

April 29, 1909.

Mr. Harry B. Palmer;
10 Fifth Ave.,
New York City.

My dear Mr. Palmer:

Since you were here this morning, I have had the Edison file looked up and have taken therefrom various papers which show the history of the application. They are enclosed herewith, and I think you will find that they are all that is needed to fully explain the status of the case.

Please note that the last action on this case was made September 19, 1908, and hence amendment is required prior to September 19, 1909, that is to say, within one year if the case is to be kept alive and to be further prosecuted.

I have no copy of the drawings but think Mr. Edison must have one as several were made. Neither have I copies of the citations for they were sent to Mr. Edison long since.

If the case is to be further prosecuted by me, kindly let me have your full instructions as soon as possible, and I shall be very glad to take up the matter.

Yours truly,

Fred. E. Tasker

Reliance



Edison
DOUBLE SYSTEM

JEFFERY-DEWITT COMPANY
SPARK PLUG MANUFACTURERS
NUMBERS 217 and 219 HIGH STREET
L. D. TELEPHONE 162 BRANCH BROOK CABLE ADDRESS: "RELIANCE," NEWARK

Newark, N. J., July 29, 1909.

Wm. L. Edison,
Pleasantdale, N.J.

Dear Sir:-

That have you done about securing patent papers, etc., so we can go ahead in the matter, and have our patent attorney see what claims can be obtained. I believe the time must be very limited in which an amendment can be filed, and unless you give this your very prompt attention, your patent will be taken from the files.
We await your pleasure.

Very truly yours,

JEFFERY-DEWITT COMPANY,
[Signature]

Per

August, 25, 09.

Hon. Commissioner of Patents.,
Washington, D.C.

Sir.
Sir.

Kindly make and send me as soon as possible copies of the following patents cited in application of W.L. Edison, spark plugs filed June, 9, 08. serial # 437515.

French patent to Sharp.	364,298	(123-169)
" " " Jeffery.	376,219	(123-169)
German " " Veigel.	192,650	(123-169)
Swiss " " Sanders.	28,333	(123-169)

Refer you to office action of Sept.19,1908 regarding this last number.

Kindly make this charge to W.L. Edison sending bill to me and oblige.

Very truly yours.

JMC/AP

general Counsel.

All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

LMF

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

Sept. 1, 1909

Sir:

Your letter of Aug. 25/09 (No. 163160) has been received. In reply you are informed that copies of Specifications of French Patent 364,298 will cost (\$1.00), print of drawings (25¢), French Patent 376,219 (\$3.00), print (25¢), German Patent 192,650 (80¢), print (25¢), Swiss Patent 28,333 (\$1.20), print (25¢),

\$7.00

the same will be prepared and forwarded to your address on receipt of \$ fee as above. W. L. Edison has no account with this Office for such copies.

RETURN THIS CIRCULAR WITH FEE.

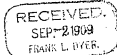
Very respectfully,

E. B. Moore.
Commissioner of Patents.

Mr. Frank L. Dyer,

Orange,

N. J.



Commissioner of Patents:

Inclosed please find \$ _____, the amount of fee called
for in above circular.

CHECKS SENT TO THE PATENT OFFICE IN PAYMENT OF FEES SHOULD BE CERTIFIED.

Sept. 2, 1909

Hon. Commissioner of Patents,
Washington, D. C.

S i r :

In reply to your letter No. 163,160, kindly hasten
the translations of these patents and charge the cost thereof
to my account.

Yours very truly,

General Counsel.

JMC/JS

All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

RAS.

Letter No. 167,098
Division E.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.

September 8, 1909.

Mr. Frank L. Dyer,
Orange, N. J.



Sir:

The Commissioner directs me to acknowledge the receipt of your letter of the 2nd inst., relative to your order of Aug. 25th for copies of four foreign patents, requesting that the translations be hastened.

In reply you are advised that your order was for copies of the patents and the estimate furnished you on September 1st was for copies only of the specifications, the cost of which is \$6.00. Your account is insufficient to cover the cost of translations of the specifications, which would be \$30.00.

Please notify the Office just what you desire and if necessary make a further deposit.

Very respectfully,

H. B. Hoarland
Chief Clerk. *m*

Confidential

L. S. BACON
JOSEPH H. MILANS
CANTIN H. MILANS
THOMAS H. MILANS
GEORGE H. MILANS

BACON & MILANS

Counsellors at Law

SOLICITORS IN PATENT AND TRADE-MARK CAUSES
MCGILL BUILDING, 908 G STREET, NORTHWEST
WASHINGTON, D. C.

CABLE ADDRESS
"BACON"

LONG DISTANCE TELEPHONE
MAIN 1803

September 8, 1909.

Frank L. Dyer, Esq.,
Orange, N.J.

Dear Sir:

We are in receipt of your favor of the 7th inst., in the matter of your order on the Patent Office for translations of certain French, German and Swiss patents cited in the application of W.L. Edison. Upon looking up the matter in the Office today we found that some confusion had arisen as to whether you desired translations of the patents or just copies of the specifications. A letter to this effect was mailed to you yesterday or today from the Patent Office.

We were informed by the clerk in charge that the Office could complete the work by the 14th and that the charge for the translations and prints of the drawings will be \$31.00. We understand that it will be satisfactory if the translations and prints are mailed from the Patent Office on the 14th and we have accordingly instructed the clerk to proceed with the translations and have filed the amount of \$31.00 to cover the cost of the same.

The other matters referred to in your favor are receiving attention and will be reported on shortly.

Completed

BACON & MILANS.

SHEET No. 2 DATE 9/8/09

F.L.D.

Following your instructions we are noting the
charge in this matter against William L. Edison.

Yours very truly,

Bacon & Milans

R/GW

Sept. 9/09

Canfield - 10 A. M.

Bacon & Milans

Stop Patent Office translations regard W. L. Edison.
Secure copies and forward at once. Translations not wanted.

Frank L. Dyer.

FRED E. TASKER,
COUNSELLOR AT LAW.
PATENT LAW EXCLUSIVELY,
HUDSON TERMINAL,
20 CHURCH STREET,
NEW YORK.

September 9, 1909.

Dyer Smith, Esq.,
Legal Dept. of Thomas A. Edison,
Orange, N. J.

Dear Sir:

Enclosed please find associate power of attorney
in Mr. Edison's Spark Plug case, which I trust you will find
satisfactory.

Yours truly,

Fred E. Tasker

L. R. BACON
JOSEPH H. MILANS
—
CALVIN T. MILANS
THOMAS E. HEATH
GEORGE B. BILEY

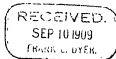
BACON & MILANS
Counsellors at Law

SOLICITORS IN PATENT AND TRADE-MARK CAUSES
MCGILL BUILDING, 908 G STREET, NORTHWEST
WASHINGTON, D. C.

CABLE ADDRESS
"NOCAN"
—
LONG DISTANCE TELEPHONE
MAIN 1880

Sept. 9, 1909.

Frank L. Dyer, Esq.,
Orange, N. J.,



Dear Sir:

We are in receipt of your telegram dated Sept 9,
and reading as follows:

"Stop patent Office translations regard W. L. Edison
secure copies and forward at once translations not
wanted."

We accordingly canceled the order for the trans-
lations and at that time were informed that it is
doubtful if the Patent Office could complete the work
of making copies of the specifications by the 14th.
We therefore did not leave this work for the Office
but are having the copies made and expect to mail them
by the 14th.

We have filed an order in the Patent Office for
prints of the French, German and Swiss patents and
also of the British patent to Sharp 3402 of 1906.
We had the order made special and the Office has promised
to let us have the same in time to forward by the 14th.

In order to avoid confusion and delay, when we filed
\$31 for the translations, we took the liberty of signing
your name to the letter. In canceling the order for

Amended

HACON & MILANS.

SHEET No. 2 DATE Sept. 9, 1909.

the translation, we requested that this amount be refunded and in due course you should receive the same from the Office. We are accordingly noting a charge of this amount against your account.

We are having a copy made of the specification of British patent to Sharpe 3402 of 1906. The same will be sent shortly.

In Office letter of Sept. 19 '08 in regard to the W. L. Edison application the citation referred to by you is 889338 to Schulze, June 2, 1908, rather than 880338, the number given in your favor. We referred this matter to the Examiner, who stated that it is his intention to cite the Schulze patent.

Yours very truly,

R/GAB.

David A. Milans

Sept. 9, 1909

Hon. Commissioner of Patents,
Washington, D. C.

RE APPLICATION OF W. L. EDISON, SPARK PLUGS, FILED
JUNE 9, 1908, SERIAL NO. 437,515

S i r :

I beg to enclose associate power of attorney given
me in this application by Fred E. Tasker, the attorney of record.
Kindly direct all official actions in this case to me.

Very respectfully,

Attorney

DS/JS

Enc.

Sept. 10, 1909

Fred E. Tasker, Esq.,
50 Church Street,
New York, N. Y.

Dear Sir:

I have your favor of September 9th enclosing associate
power of attorney in Mr. William L. Edison's Spark Plug case,
for which I thank you.

Yours very truly,

DS/JS

Sept. 15, 1909

Messrs. Bacon & Milans,
908 G Street, N. W.
Washington, D. C.

Gentlemen:

Kindly inquire in Room No. 382 of the Patent Office in the case of William L. Edison, Serial No. 437,515, SPARK PLUGS, whether the associate power of attorney given me in this case by Fred E. Taskor, 50 Church Street, New York, the original attorney of record, has been received and is satisfactory. I filed this associate power of attorney some days ago, but have not received acknowledgment from the Office. I am forwarding an amendment in this case to the Office today, and as the year for action expires Saturday, September 18th, kindly wire me if the power of attorney to me is not satisfactory or has not been received.

Yours very truly,

DS/JS

General Counsel.

IN THE UNITED STATES PATENT OFFICE

William L. Edison)

SPARK PLUGS)

Filed June 9, 1908)

Serial No. 437,515)

Room No. 382

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of September 19, 1908, please amend the above entitled case as follows:

Cancel all the claims and substitute the following:

Emended 10/14/12 Insert A - Claims 1 and 2
1. In a spark plug, the combination of a non-conducting core, a conducting bushing, an electrical conductor passing longitudinally through the core and tapering gradually as it extends toward the spark gap, and a fine gauge sparking terminal secured to the small extremity of said conductor, substantially as described.

2. In a spark plug, the combination of a non-conducting core, a conducting bushing, an electrical conductor passing longitudinally through the core and tapering gradually as it extends toward the spark gap, and a fine gauge sparking terminal secured to the small extremity of said conductor, the extreme outer end of said terminal lying flush with the sparking end of said core, substantially as described.

Cancelled, 10/10/10

3. In a spark plug, the combination of a non-conducting core having a conical sparking end, ^{and a pair of} an electrical conductor passing through the core, and a fine-gauge sparking terminal secured to the end of said conductor, said terminal terminating in the conical surface of said sparking end ^{on the apex of the} between the apex and the base of the cone, substantially as described.

4. In a spark plug, the combination of a non-conducting core having a conical sparking end, ~~a pair of independent electrical circuits~~, ^{2 insulated from each other} a pair of conductors, ~~one in each circuit~~, and passing longitudinally through the core, and a fine gauge sparking terminal secured to the end of each conductor, said terminals terminating in the conical surface of said sparking end on opposite sides of the apex of the cone, substantially as described.

5. In a spark plug, the combination of a non-conducting core having a conical sparking end, ~~a pair of independent electrical circuits~~, ^{insulated from each other} a pair of conductors, ~~one in each circuit~~, and passing longitudinally through the core, and a fine gauge sparking terminal secured to the end of each conductor, said terminals terminating in the conical surface of said sparking end on opposite sides of the apex of the cone, and said terminals being baked in the core, a conducting bushing surrounding said core, and spark terminals carried by said bushing and co-operating with said first mentioned terminals to form spark gaps, substantially as described.

Cancelled 10/18/00

6. In a spark plug, the combination of a non-conducting core, an electrical conductor extending longitudinally through the same, said conductor having its upper end located some distance below the upper end of the core, said core being provided with a longitudinal recess above the upper end of said conductor, a conducting member adjusted in said recess into firm contact with the upper end of said conductor, and a connection for an outside circuit connected to said member, substantially as described.

7. In a spark plug, the combination of a non-conducting core, a pair of independent electrical circuits, a pair of conductors, one in each circuit and passing longitudinally through the core, said conductors being twisted into spiral shape, substantially as described.

8. In a spark plug, the combination of a non-conducting core, an electrical conductor extending longitudinally through the same, said conductor having its upper end located some distance below the upper end of the core, said core being provided with a longitudinal recess above the upper end of said conductor, a removable conducting member adjusted in said recess into firm contact with the end of said conductor, and a laterally extending circuit connection electrically connected to said member, substantially as described.

Insert A - Claims 4, 5, 6 and 7

REMARKS.

Page 2, line 12, the numerals 2a and 2b are in Figure 6 of the drawings.

Page 3, line 11, the Examiner is requested to apply the reference character 16 to the binding screws illustrated to the right and the left of the upper part of member 2 in Figures 1 and 2. He is also requested to change the numeral 14 to 16 in Figure 4, designating said binding screws.

The claims have been carefully rewritten in view of the references and are thought to be patentable thereover. In none of the references is a fine wire sparking terminal illustrated as secured to a tapered ordinary conductor passing through the core. Neither is the construction shown of a core having a conical sparking end, the two sparking terminals having their ends flush with the conical surface of the end of the core on opposite sides of the apex of the cone, so that the interposition of the latter between the terminals prevents the possibility of short circuiting. The structure claimed in Claims 6 and 8, in which a removable and adjustable member contacting the upper end of the conductor within the core, this member being in electrical contact with the outside circuit connection, is claimed, would seem to be patentable over the references. Also, the structure claimed in Claim 7 is not met in any of the references. In neither the patent to Schultz nor the British patent to Sharpe is the idea disclosed of twisting the conductor spirally within the insulating core for the purpose of strengthening the latter. Experience has shown the beneficial results of this construction.

Reconsideration and allowance of all the claims
are requested.

Respectfully submitted.

WILLIAM L. EDISON

By Frank L. Dyer

His Attorney

Orange, New Jersey

September 15, 1909.

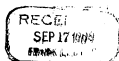
L. S. HADON
JOSEPH H. MILAN
GALVIN T. MILAN
THOMAS H. MILAN
GEORGE S. MILAN

BACON & MILANS
Counsellors at Law

SOLICITORS IN PATENT AND TRADE-MARK CAUSES
MCGILL BUILDING, 808 G STREET, NORTHWEST
WASHINGTON, D. C.

CABLE ADDRESS
"NOCAM"

LONG DISTANCE TELEPHONE
MAIN 1801



September 16, 1909.

Frank L. Dyer, Esq.,

Orange, N.J.

Dear Sir:

Re W. L. Edison Application Serial No. 437, \$15 Spark-
Plugs.

We are in receipt of your favor of the 15th inst., and would advise you that upon inquiry at the Patent Office we find that your associate power of attorney in this application has been duly received and entered in the Patent Office.

Yours very truly,

Bacon & Milans

R/GW

P.S. The associate power is apparently satisfactory. In this connection we were advised by the Examiner in charge of this Division that it is not the custom or rule of the Office to acknowledge by letter the receipt of associate powers.

Smith

527

2-200.

Div. 28 Room 332

ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

RYH

Paper No.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.

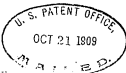
Oct. 21, 1909.

William L. Edison,

c/o Frank L. Dyer, Esq.

Orange, N. J.

OCT 22 1909
FRANK L. DYER.



Please find below a communication from the EXAMINER in charge of your application.

S. No. 437,618, filed June 9, 1908, Spark Plugs.

E. B. Moore

Commissioner of Patents.

Case considered as amended Sept. 15, 1909.

Claims 4, 5 and 7, the reference to the circuits, in lines 2, 3 and 4, should be omitted. The circuits are not in the spark plug, as the preamble to these three claims specifies.

Claims 1 and 2 are rejected on Jeffery, in view of Sander. To make the rod 5 in Fig. 1 of Jeffery tapered, as in Sander, is not patentable.

Claim 3 is rejected on Jeffery, of record. To make the inner end of the core 4 of Jeffery conical, or to give it any other convenient shape, is not believed to amount to invention. See 916,313, Herrington, Mar. 23, 1909 (173, Conductors), showing a terminal flush with a spherical surface.

Claim 6 is rejected on
German Patent to De Dion, 131,431.
French Patent to De Dicken, 337,419
(123-169).

Claim 7 is rejected on either of the patents to Sharpe, or on Orswell.

To make the insulated conductors of Sharpe of spiral form is held to be a mere matter of choice, and not invention.

Claim 8 is rejected on De Dicken, above cited. To connect

Copyfile

-2- (Edison, 437,515).

a conductor to the part c of the reference, if preferred, instead of
to the stem t, is held to be too obvious to be patentable.

WFN

Examiner.

IN THE UNITED STATES PATENT OFFICE

William L. Edison :
SPARK PLUGS : Room No. 382.
Filed June 9, 1908 :
Serial No. 437,515 :

HONORABLE COMMISSIONER OF PATENTS

S I R : -

In response to rejection of October
21st, 1909, please amend this case as follows:-

Cancel Claims 1, 2, 3, 6, 7 and 8.

Insert the following claims numbered 1 and 2:-

1. In a spark plug, the combination of a non-conducting core having a conical sparking end and a pair of electrical conductors insulated from each other and passing longitudinally through the core, said conductors terminating ^{and with a swell} in the conical surface of said sparking end on opposite sides of the apex of the cone, substantially as described.

2. In a spark plug, the combination of a non-conducting core having a sparking end formed with a ^{projection} swelling or protuberance, and a pair of electrical conductors insulated from each other and passing longitudinally through the core, said conductors terminating on opposite sides of said ^{projection on} swelling in said sparking end with said ^{projection} swelling interposed between the ends thereof, substantially as described.

Claim 4, lines 2 and 3, cancel "a pair of independent electrical circuits". Line 4, cancel "one in each circuit" and substitute - insulated from each other -.

Claim 5, lines 2 and 3, cancel "a pair of independent electrical circuits". Line 4, cancel "one in each circuit" and substitute - insulated from each other -.

Renumber Claims 4 and 5 as 3 and 4.

R E M A R K S

Reconsideration and allowance are requested.

The rejected claims have been canceled, and those objected to have been amended to overcome the Examiner's objections. Claims 1 and 2 inserted by this amendment are thought to be patentable over the references, the broad subject matter of the conical sparking end or sparking end having a swelling upon opposite sides of which the terminals of the conductors are situated to prevent short-circuiting thereof, being apparently novel.

Respectfully submitted,

WILLIAM L. EDISON

By Frank H. Dyer

His Attorney

Orange, New Jersey

October 19th, 1910.

Div. 28. Room 03.

2-200

Paper No. 9

Address only
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

RYH

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

Nov. 18, 1910.

William L. Edison,
c/o Frank L. Dyer, Esq.,
Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

S. No. 437,515, filed June 9, 1908, Spark Plugs.

E. B. Moore

Commissioner of Patents.

Case considered as amended Oct. 20, 1910.

Claim 2, lines 2 and 3, "swelling or protuberance" should be
projection. Line 6, "swelling" should be projection, and "in"
should be on.

WEN

Examiner.

IN THE UNITED STATES PATENT OFFICE

William L. Edison :
SPARK PLUGS : Room No. 382.
Filed June 9, 1908 :
Serial No. 437,515 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to Office letter of
November 18, 1910, please amend this case as follows:-

Claim 2, lines 2 and 3, cancel "swelling or
protuberance" and substitute - projection - . Same claim,
line 6, cancel "swelling in" and substitute - projection
on - . Line 7, cancel "swelling" and substitute -
projection - .

R E M A R K S

The Examiner's objections have been overcome, and
this case is thought to be in condition for immediate al-
lowance which is requested.

Respectfully submitted,

WILLIAM L. EDISON

By

Frank A. Dyer

His Attorney

Orange, New Jersey

November 22nd, 1910.

(COPY)

Div. 28 Room 63

Paper No. 11

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

Washington, Dec. 3, 1910.

William L. Edison,

c/o Frank L. Dyer, Esq.,
Orange, N. J.

U. S. Patent Office

Dec. 3, 1910

M A I L E D

Please find below a communication from the EXAMINER in charge of your application. S. No. 437,515, filed June 9, 1908, Spark Plugs.

E. B. MOORE,

Commissioner of Patents.

For the purpose of interference, it is suggested that the applicant make the following patentable claim:

In a spark plug, an insulating member, two or more conductors carried by said member and terminating outside of said insulating member, a portion of said insulating member extending between the extremities of the conductors.

Failure of the applicant to make this claim within thirty days will be taken as a disclaimer of the invention covered by the claim, as provided in Rule 96.

HSM

Copy to William L. Edison,
Orange, N. J.

Examiner.

Copy to Frank L. Dyer, Esq.,
Orange, N. J.

Div. 28 Room 63

2-280

Paper No. 11

Address only
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

RYH

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

Dec. 3, 1910.

William L. Edison,
c/o Frank L. Dyer, Esq.,
Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

S. No. 437,515, filed June 9, 1908, Spark Plugs.

E. B. Moore

Commissioner of Patents.

For the purpose of interference, it is suggested that the applicant make the following patentable claim:

5 In a spark plug, an insulating member, two or more conductors carried by said member and terminating outside of said insulating member, a portion of said insulating member extending between the extremities of the conductors.

Failure of the applicant to make this claim within thirty days will be taken as a disclaimer of the invention covered by the claim, as provided in Rule 96.

HSM

Copy to William L. Edison,
Orange, N. J.;

Copy to Frank L. Dyer, Esq.,
Orange, N. J.

*begin - find
new one this*
Byron
Examiner.

F527

File

IN THE UNITED STATES PATENT OFFICE

William L. Edison :
SPARK PLUGS : Room No. 63
Filed June 9, 1908 :
Serial No. 437,515 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to Office letter of
December 3, 1910, please amend this case as follows:-

Insert the following claim:-

~~5. In a spark plug, an insulating member, two or
more conductors carried by said member and terminating out-
side of said insulating member, a portion of said insul-
ating member extending between the extremities of the
conductors.~~

R E M A R K S

The claim suggested by the Examiner has been in-
serted in the application by the above amendment, and it
is hoped that the proposed interference may shortly be
declared..

Respectfully submitted,

WILLIAM L. EDISON

By

Frank L. Dyer

His Attorney

Orange, N. J.

December 6, 1910

File
Folio No. 527

Dec. 7, 1910

Mr. William L. Edison,
Salisbury, Maryland.

Dear Mr. Edison:-

Your application on Spark Plugs is apparently going to get into an interference, as you will see by the enclosed letter from the Patent Office. I have added the claim suggested by the Examiner to your application, and the interference will probably be declared within perhaps five weeks. When that is done, we will be able to tell how early the other man filed his application and what our chances are. Since your application is already two years old, I should think it likely that we had a very good chance indeed.

Yours very truly,

DS-JS

Enc.

Div. 28 Room 53

2-260

Paper No. 17

Address only
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

RXH

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

Dec. 15, 1911.

William L. Edison,

c/o Frank L. Dyer, Esq.,

Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

S. No. 437,515, filed June 9, 1908, Spark Plugs.

E. B. Moore

Commissioner of Patents.

Claims 2 and 5 are rejected on the issue of the interference.

Claim 1 is rejected on the issue of interference. To have
the part of the core between the two electrodes conical is not
patentable, in view of

German Patent 32,332 (123-169),

and to have the electrodes terminate flush with the insulator is
old, in view of

Jeffery, 942,646, Dec. 7, 1909 (123-169).

Claims 3 and 4 are rejected on the same ground and references,
the Jeffery patent showing fine gage terminals, baked in the plug.

HSM

Asst. Examiner in charge.

IN THE UNITED STATES PATENT OFFICE

William L. Edison

SPARK PLUGS

Filed June 9, 1908

Serial No. 437,515

Room No. 382.

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office action of December 15, 1911, please amend the above entitled case as follows:-

Page 3, line 18, after "17" insert - and 17a - .
Lines 20 and 21, change "terminal" to - terminals - .
Line 21, after "17" insert - and 17a - . Same line,
cancel "a circuit is" and insert - the circuits are - .

Claim 1, line 5, and claims 3 and 4, line 6,
cancel "in" and insert - flush with - .

Cancel claims 2 and 5 and renumber claims 3 and 4
as 2 and 3.

Add the following claims: -

Cancelled 5/11/13
4. In a spark plug, the combination of a non-conducting core having a conductor therein terminating eccentrically of one end thereof, a conducting bushing in which the core is adapted to be secured and which is provided at one end with a terminal or sparking point for co-operation with the terminal of the conductor in the non-conducting

Amended 10/1/13
core, and means which upon the assembling of the core and bushing insures the correct relative positioning of the terminals to form a spark gap, substantially as described.

5. In a spark plug, the combination of a non-conducting core having a sparking end and a pair of conductors therein insulated from each other and terminating in the sparking end eccentrically thereof, a conducting bushing in which the core is secured and which is provided at one end with a pair of terminals or sparking points for respectively co-operating with the terminals of the conductors in the non-conducting core to form a pair of spark gaps, said core and bushing being provided with co-operating means which upon the assembling of the core and bushing insures that the respective spark gap terminals thereof will always be brought opposite each other to form said spark gaps, substantially as described.

6. In a spark plug, the combination of a non-conducting core having a conical sparking end and a pair of electrical conductors insulated from each other and passing longitudinally through the core, said conductors terminating flush with the conical surface of said sparking end on opposite sides of the apex of the cone, a conducting bushing surrounding said core, and a pair of sparking terminals carried by said bushing adapted to co-operate with the terminals of the electrical conductors of the core to form a pair of spark gaps, said core and bushing being provided with co-operating means which upon the assembling of the core and bushing insures that said terminals will always be brought into the same relative and correct positions to form said spark gaps, substantially as described.

5. In a spark plug, the combination of a non-conducting core having a conical sparking end, a pair of conductors insulated from each other and passing longitudinally through the core, a fine gauge sparking terminal secured to the end of each conductor, said terminals terminating flush with the conical surface of said sparking end on opposite sides of the apex of the cone, a conducting bushing surrounding the said core, and sparking terminals carried by said bushing and co-operating with said first mentioned terminals to form spark gaps, said core and bushing being provided with co-operating means which upon the assembling of the core and bushing insures that said terminals will always be brought into the same relative and correct positions to form said spark gaps, substantially as described. -

R E M A R K S

The Examiner is requested to apply the reference character 18 in Figures 1, 2 and 3 to the cap on the core 2.

None of the references discloses a spark plug in which the non-conducting core has a conical sparking end and in which the conductors passing through the core terminate flush with the conical surface of the sparking end and on opposite sides thereof, and present claims 1, 2 and 3 are therefore thought to be allowable. Such a structure produces terminals tapered to a point, which results in the intensification and concentration of the current at the spark gaps to produce stronger sparks than would be possible in the structure disclosed by the Jeffery patent, in which the terminal of the conductor in the core is a surface equal to the cross sectional area of the wire or orifice

6' taken on a plane at right angles to the axis of the conductor 5 or 5'.

New claims 4 and 5 specify that the conductor or conductors in the core terminate eccentrically of one end of the core and that means is provided which upon the assembling of the core and conducting bushing insures the correct relative positioning of the sparking terminals of the core and bushing to form a spark gap or gaps, and are thought to be clearly allowable.

New claims 6 and 7 also specify that the bushing and core are provided with co-operating means which upon the assembling of the core and bushing insures that the terminals thereof will always be brought into the same relative and correct positions to form the spark gaps. These claims further specify that the conductors of the core terminate flush with the conical surface of the sparking end of the core and on opposite sides of the apex of the cone, as set forth in claims 1, 2 and 3.

In view of the above, further consideration and allowance are requested.

Respectfully submitted,

WILLIAM L. EDISON

By Frank L. Lyger

His Attorney

Orange, New Jersey

December 12th, 1912

Div. 28 Room 63

2-200

Paper No. 10

Address only
The Commissioner of Patents,
Washington, D. C.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

RYH

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

April 28, 1913

Frank L. Dyer, Esq.,

Orange,

N. J.



Please find below a communication from the EXAMINER in charge of the application of

William L. Edison, Sr. No. 437,515, filed June 9, 1908, Spark Plugs.

4-5321

E. B. Moore

Commissioner of Patents.

Case considered as amended Dec. 13, 1912.

Claims 4 and 5 are answered by French patent to Sharpe, in
view of German patent to Veigel, both of record. There would be
no invention to provide the plug of Sharpe with an aligning device.

Claims 4 and 5 are rejected.

The other claims may be allowed.

HSM

Examiner.

IN THE UNITED STATES PATENT OFFICE

William L. Edison)

SPARK PLUGS)

Filed June 9, 1908)

Room No. 63.

Serial No. 437,515)

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office action of April 28, 1913, please amend the above entitled case as follows:-

Cancel claims 4 and 5 and renumber claims 6 and 7 as 4 and 5.

R E M A R K S

The claims rejected in the last Office action have been canceled, and an allowance of the case is accordingly requested.

Respectfully submitted,

WILLIAM L. EDISON

By Frank L. Hayer

His Attorney

Orange, New Jersey

May 10th, 1913

WH-JS

K.O'D. 2-181

Serial No. 437,515. ✓

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON Sept. 15, 1913.

William L. Edison,

Sir: Your APPLICATION for a patent for an IMPROVEMENT in
Spark Plugs,

filed June 9, 1908, has been examined and ALLOWED.

The final fee, TWENTY DOLLARS, must be paid not later than SIX MONTHS from the date of this present notice of allowance. If the final fee be not paid within that period, the patent on this application will be withheld, unless renewed with an additional fee of \$15, under the provisions of Section 4897, Revised Statutes.

The office delivers patents upon the day of their date, and on which their term begins to run. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing, will require about four weeks, and such work will not be undertaken until after payment of the necessary fee.

When you send the final fee you will also send, DISTINCTLY AND PLAINLY WRITTEN, the name of the INVENTOR and TITLE OF INVENTION AS ABOVE GIVEN, DATE OF ALLOWANCE (which is the date of this circular), DATE OF FILING, and, if assigned, the NAMES OF THE ASSIGNEES.

If you desire to have the patent issue to ASSIGNEES, an assignment containing a REQUEST to that effect, together with the FEE for recording the same, must be filed in this office on or before the date of payment of final fee.

After issue of the patent uncertified copies of the drawings and specifications may be purchased at the price of FIVE CENTS EACH. The money should accompany the order. Postage stamps will not be received.

Final fees will NOT be received from other than the applicant, his assignee or attorney, or a party in interest as shown by the records of the Patent Office.

Respectfully,

Thomas Ewing,

Commissioner of Patents.

Frank L. Dyer, Esq.,

Orange, New Jersey.

IN REMITTING THE FINAL FEE GIVE THE SERIAL NUMBER AT THE HEAD OF THIS NOTICE.

UNCERTIFIED CHECKS WILL NOT BE ACCEPTED.

[FROM WILLIAM ABBOTT HARDY]

September 27, 1913

Mr. William L. Edison,
Sussex Avenue,
Morristown, N. J.

Dear Mr. Edison:-

Your patent application Serial No. 437,515, filed June 9, 1908 and entitled Spark Plugs, was allowed on the 15th inst.

You will recall that in 1911 this application was put in interference with an application of James E. Murray, and that priority was awarded to Mr. Murray. Consequently, the claims (five in number) allowed in your application are quite narrow, being limited to a spark plug provided with a non-conducting core having a conical sparking end, and a pair of electrical conductors insulated from each other, passing longitudinally through the core, and terminating flush with the conical surface of the sparking end on opposite sides of the apex of the cone.

As I do not know whether or not you are still interested in the invention disclosed in this application, I have not as yet paid the final fee of \$20.00. Will you accordingly advise me whether or not you wish to have your father pay the final fee and the patent taken out.

Will you also kindly return the print of the drawing in your application Serial No. 526,428, filed Nov. 5, 1909, entitled Air Pumps, and the copies of the references cited therein, which I sent you on July 23, 1913.

Very truly yours,

WH-JS

Mr Holden! —

Shall I ask Mr. Miller
for check, - and pay
final fee on this
application? Yrs.
R. H. H. H. H.

513
November 13, 1913

Mr. H. P. Miller;

Please let me have check for twenty dollars,
drawn to order of Commissioner of Patents, final fee on the
application of William L. Edison, entitled SPARK PLUGS, filed
June 9, 1909, Serial No. 427, ⁵¹³and allowed Sept. 15, 1913.

M. J. Laidlaw

November 19, 1913

Hon. Commissioner of Patents,
Washington, D. C.

S I P :

Enclosed please find check for twenty
dollars, final fee for the application of William L. Hinson,
entitled SPUR PLUGS, Serial No. 437,515, filed June 9, 1908,
and allowed September 15, 1913. Kindly pass this case
to issue.

Respectfully,

Frank L. Dyer

WLE
enclosure

Nov. 26, 1913

Hon. Commissioner of Patents,
Washington, D. C.

S I R :

On November 19th I wrote you, enclosing check for twenty dollars, final fee for the application of William L. Edick, entitled SPARE PLUGS, filed June 9, 1908, Serial No. 437,515, and allowed September 15, 1913. We have not as yet received the usual acknowledgment of this check. Kindly advise if same has been received by you.

Respectfully,

WLL

ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

CWJ

Letter No.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

November 29th, 1913.

Mr. Frank L. Dyer
Orange, N. J.

Sir:

Referring to your communication of the 26th instant, relative to the acknowledgment of receipt of final fee in the application of William L. Edison, Serial No. 437,515, for Spark Plugs, you are advised that the final fee Twenty Dollars was received in this Office November 20th, 1913, and applied as directed to the above application.

Letters Patent will issue thereon December 16, 1913, and in accordance with the rules of this Office will be mailed to the attorney of record Mr. Fred E. Tasker, 50 Church St., New York, N. Y.

Respectfully,

W. F. Woolard
Chief Clerk.

*sent sub.
from of attorney firm
Wall Edison*

December 2, 1913.

Mr. William L. Edison,
Sussex Ave.,
Morristown, N. J.

Dear Mr. Edison:

The final fee on ^{your} the patent application,
Serial No. 437,515, entitled Spark Plugs, filed June 9,
1908 and allowed September 15, 1913, has been paid and
the patent will issue thereon on the 16th inst.

As matters now stand, the patent will be mailed
to the original attorney of record, Mr. Fred R. Tasker
of #50 Church Street, New York City, as Mr. Dyer was
appointed only the associate attorney in this case and
not a substitute attorney. I do not know what your
relations with Mr. Tasker are, but if, for any reason,
you wish to have the patent sent to this office
instead of to Mr. Tasker, it will be necessary to revoke
Mr. Tasker's Power of Attorney and to appoint Dyer & Holden
as substitute attorneys. Accordingly, if you wish the
patent to be mailed to this office, will you kindly sign
the enclosed form of revocation and substitute power
of attorney and return to me at your earliest convenience
in order that I may file the same in the Patent Office
within the next three or four days.

Very truly yours,

WAH-KGK

IN THE UNITED STATES PATENT OFFICE.

WILLIAM L. EDISON,)
SPARK PLUGS,)
Filed June 9, 1908,) Room No. 63
Serial No. 437,515.)

REVOCATION OF POWER OF ATTORNEY AND
APPOINTMENT OF SUBSTITUTE ATTORNEY.

HONORABLE COMMISSIONER OF PATENTS,

S I R:

The undersigned hereby revokes the Power of Attorney given by him in the above entitled application to Fred E. Tasker of #50 Church Street, New York City, New York, as well as any associate power of attorney given thereunder, and nominates and appoints Dyer & Holden (Registration No. 3244) a firm composed of Frank L. Dyer and Delos Holden, whose address is Edison Office Building, Orange, New Jersey, as substitute attorneys with the request that all future correspondence with respect to this application and the patent when issued thereon be sent to them.

Signed at Morristown, County of Morris, and
State of New Jersey this 5th day of December, 1913.

William L. Edison

IN THE UNITED STATES PATENT OFFICE.

WILLIAM L. EDISON,)
SPARK PLUGS,) Room No. 63
Filed June 9, 1908,)
Serial No. 437,515.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

A substitute Power of Attorney in the above entitled application is enclosed herewith. As the first fee has been paid in this application and the patent is to issue thereon on the 16th inst. it is requested that early attention be given to this matter in order that the patent will be mailed to the proper address.

Respectfully,

WILLIAM L. EDISON,

By Dyer and Holden
his Attorneys.

Orange, New Jersey,
December 8 1913.

WAH-KGX

EEG ADDRESS ONLY
THE COMMISSIONER OF PATENTS
WASHINGTON, D. C.

2-060

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.

December 11, 1913

You are hereby informed that YOUR POWER OF ATTORNEY HAS BEEN
~~REVOKED~~ ACCEPTED in the matter of the application of William L.

Edison

for Letters Patent for an IMPROVEMENT IN Spark Plugs

No. 437,515 Filed June 9, 1908

Very respectfully,

Thomas Ewing

Commissioner.

Dyer and Holden

Edison Office Bldg.

Orange, N. J.

Folio No. 422

Serial No. 448,293

Applicant.

Thomas A. Edison

Address.

Newlynn Park

Title Census Buildings and Process of Constructing Same

Filed Aug. 13 1908

Examiner's Room No. 218

Assignee Thomas A. Edison & Son

Ass't Exec. June 30, 1912 Recorded July 3, 1916 Liber 3127 Page 52

Patent No. 1,219,222 Issued March 13, 1917

ACTIONS.

- | | |
|--|---|
| 1 Rejection <u>Oct 30, 1908</u> | 16 Variation of Examiner in this <u>8/17/16</u> |
| 2 Amended <u>Oct 28, 1909</u> | 17 Amended <u>Nov 16, 1916</u> |
| 3 Rejection <u>Nov 17, 1909</u> | 18 allowed <u>Nov 23, 1916</u> |
| 4 Amended <u>November 15, 1910</u> | 19 Final <u>Dec due May 23, 1917</u> |
| 5 Rejected <u>Dec 22, 1910</u> | 20 Amended <u>under Rule 29, Aug 24, 1917</u> |
| 6 Amended <u>Dec 20, 1911</u> | 21 Amendment approved <u>Feb 2, 1917</u> |
| 7 Office letter <u>Feb 14, 1912</u> | 22 Final <u>Tested Feb 17, 1917</u> |
| 8 Amended <u>Feb 11, 1913</u> | 23 |
| 9 Rejected <u>April 17, 1913</u> | 24 |
| 10 Amended <u>Apr 15, 1914</u> | 25 |
| 11 Rejected <u>May 28, 1914</u> | 26 |
| 12 Amended <u>May 22, 1915</u> | 27 |
| 13 Rejected <u>June 1, 1915</u> | 28 |
| 14 Ad to Examiner in Chief <u>May 16, 1916</u> | 29 |
| 15 Date of Hearing <u>July 26, 1916</u> | 30 |

VAULT

FRANK L. DYER,

Associate Power of
Att'y to Ruffalo & Bull

Counsel,
ORANGE, NEW JERSEY.

File 305
May 20/08
G. H. Davis
422 / Over -
Ready, L. Davis May 27, 1908

The object of this insulation is to cheapen
the cost of constructing moulds for casting
houses at one operation.

The invention consists in pouring the liquid like
concrete into the mould at such a rate
as compared with the hard setting time of
the concrete that only a short column of
the concrete with cast to create hydraulic
pressure in the moulds -

If a house 40 feet high is to be poured at
one operation with liquid like concrete,
which is fed continuously to the top, & very
rapidly so the whole of the concrete is
poured in 3 or 4 hours, the lower part
of the iron moulds will be subjected
to hydraulic pressure of several thousands
of pounds per square foot of mould.

this requires that they shall be made heavy to withstand the pressure of pressure alignment & not ~~be~~ be distorted

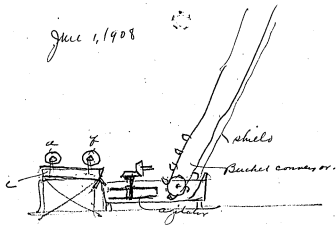
~~a column~~ The pressure would nearly equal a water column of corresponding height if the concrete was placed liquid at the bottom when the whole mass was poured. - It is very desirable that the flow of concrete into the moulds should ~~be~~ not be intermittent as it tends to produce seams it is also desirable to have it poured as soon as possible to save expense - but if poured too rapid as a bore out of the moulds ~~will~~ must be heavy - by using a rapidly hardening cement ground very fine and pouring at such a rate that when the column of concrete has reached up to the form story say 10 ft the ~~top~~ bottom for var.

two or 3 ft has hardened sufficiently
 to prevent it from flowing or acting
 hydraulically to put pressure on
 the mould adjacent, hence the mould
 need not be made stronger than to
 withstand the pressure of a column
 of liquid concrete 4 or 8 ft high -
 Thus there is a combination between
 the hardening time, the rate of pouring
 & the strength of the mould to produce
 the best commercial result,
 & these 3 factors should be predetermined.

Edison

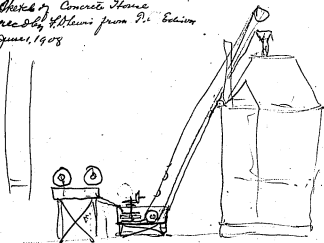
~~the question of the strength of the mould is a very important one and should be determined by the rate of pouring and the hardening time of the concrete.~~

June 1, 1908

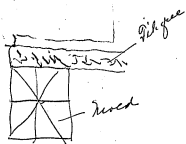


The concrete is mixed in machine a & b. The mixture is poured out of one mixer into c and then if OK it is allowed to be poured into agitator tank if not it poured on the ground
L.H.E.

Sketch of Concrete House
ready by H. H. Lewis from Dr. E. H. Lewis
June 1, 1908



Y R. 2. 08
Jan 1



200



Moscow staggered S.H.E.

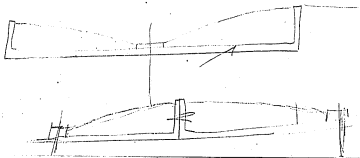
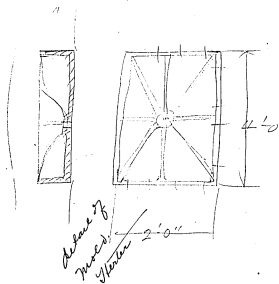


Ceiling lines

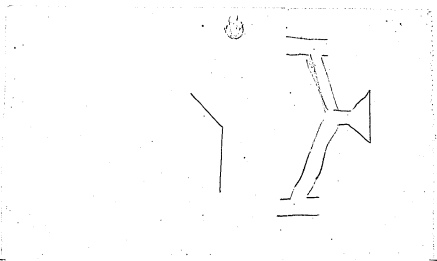


*Cement ring
around reinforcing rod*

P.H.E.



[ON BACK OF PRECEDING PAGE]



J-422

Hardy:-

Divisional applications
are to be prepared in this
case, & other appropriate
actions taken. Will you
kindly look to me about
it.

VK

Aug 25, 1946.

Exam - Process of constructing cement building;
No 448293. - Aug 13 '08

Novel features:

- (1) ^{including} complete double-wall mold
- (2) pouring at speed proportional to rate of setting of cement

Novel result:

Mono-lithic house including floors, partitions & roof.
Poured in one continuous operation

Mostly novel conception mode of building houses

Ex tremely reasonable art

To conceive brain new mode in such art evidence of invention

Excellent example of quality of imagination is distinguished

invention mind from "man skills in the art"

"expected style of calling

3 grounds of rejection

(1) Monopole use of 1 to 4 - 5 to 8

(2) 3 x 4 defining nothing better one 1 + 2

(3) 5 to 8 anticipated by Wood 86 ⁷⁸

Folio No. 423

Serial No. 448,292

Applicant.

Address.

Thomas A. Edison

Title Color Picture Exhibiting Apparatus

Filed Aug. 13, 1908 Examiner's Room No. 312

Assignee

Ass't Exec. Recorded Liber Page

Patent No. Issued

ACTIONS.

- | | | | |
|----|------------------------------|----|---|
| 1 | Rejected Oct. 9, 1908. | 16 | Amended application to
include claims as set forth |
| 2 | Amended Oct. 9, 1908. | 17 | Franklin Edison |
| 3 | Rejected Nov. 15, 1909. | 18 | |
| 4 | Amended Nov. 14, 1910. | 19 | Amended application |
| 5 | Office letter Dec. 17, 1910. | 20 | for copies of Mr. Edison's |
| 6 | Amended Dec. 7, 1911. | 21 | Nov. 15, 1913 |
| 7 | Rejected Jan. 26, 1912. | 22 | |
| 8 | | 23 | |
| 9 | | 24 | |
| 10 | | 25 | |
| 11 | | 26 | |
| 12 | | 27 | |
| 13 | | 28 | |
| 14 | | 29 | |
| 15 | | 30 | |

VAULT

FRANK L. DYER,
Counsel,
ORANGE, NEW JERSEY.

1079

August 12, 1908

Honorable Commissioner of Patents,
Washington, D. C.

S i r:

I enclose herewith drawings and application papers of
Thomas A. Edison, entitled COLORED PICTURE EXHIBITING APPARATUS,
also check for \$15.00 for filing fee thereon.

Kindly acknowledge receipt.

Very truly yours,

General Counsel.

Enc.

FEL/JS

Petition.

To the Commissioner of Patents:

Our Petitioner THOMAS ALVA EDISON,
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, in the County of Essex and State of New
Jersey,

prays that letters patent may be granted to him for the improvements in

COLORLED PICTURE EXHIBITING APPARATUS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Orange, New Jersey, his attorney, with full
power of substitution and revocation, to prosecute this application, to make
alterations and amendments therein, to receive the patent, and to transact all
business in the Patent Office connected therewith.

Thomas A. Edison

S P E C I F I C A T I O N

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT I, THOMAS ALVA EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, in the County of Essex and in the State of New Jersey, have invented certain new and useful improvements in COLORED PICTURE EXHIBITING APPARATUS, of which the following is a description:

My invention relates to improvements in the art of projecting moving pictures by means of which pictures in colors true to life may be projected on a screen or otherwise. The invention consists broadly in means for momentarily projecting an image of all the elements of a scene of one fundamental color in that color; and of thereafter successively projecting images which are superimposed upon, or ~~superimposed~~ ^{superimposed} with, the first image on the retina of the beholder, of those elements of the scene of different fundamental colors in their proper colors respectively. These successive images are projected at such a rate that in accordance with the phenomenon of persistence of vision the former images persist in the vision of the beholder until after the last image of the series has been projected upon the screen, so that the whole series of images thus projected will ~~superimpose themselves~~ ^{register} and blend together on the retina of the eye of the beholder, causing an image of the complete scene in its proper and true colors to be formed on the retina. In the case of moving pictures the scene thus produced, composed as it is of a plurality of parts of

scenes, each one consisting of those elements of the scene of one fundamental color, corresponds to a single instantaneous scene in the case of ordinary black and white moving pictures, and is followed on the film by a succession of further scenes similarly composed each of its corresponding plurality of color elements showing slight variations in movement of the scenes, so that the effect of continuous movement and animation is produced, as is common in the art. More specifically, my invention comprises a film upon which a succession of scenes have been photographed, as is common in the moving picture art, except that they have been produced at such a great rate of speed that a succession of three scenes, in case it is desired to break up the scene into its three fundamental colors, may be superimposed one upon the other without perceptible change in outline. This series of views is then considered as one view to be decomposed into its various color elements. After the positive film has been prepared, it is so treated that all the portions of each scene, except those representing the elements of that scene which are of the color which it is desired that scene should show, are rendered opaque. This may be done in various ways, as for example, by painting out the portions of the film which it is desired to render opaque, with a dark pigment.

In the preferred embodiment of my invention, a shutter carrying sections of transparent glass, or other material, of various colors, as green, red and blue, is provided, and caused to rotate in front of the display opening, continuously, while the film is fed past the same point intermittently, the feed of the film being so adjusted that that part of a scene which should be shown for example in green, is exhibited in front of the display

window during the time in which the green glass or other transparent material of the shutter is passing before the same. The opaque portion of the shutter then cuts off the view momentarily while the film is being fed forward the next section whereupon another view, displaying for example those elements of the scene which should be shown in red, is displayed at the display window while at the same time the transparent red portion of the shutter is passing across the window. After this, the opaque portion of the shutter again cuts off while the film is being fed forward another step to display the blue portion of the scene under the blue glass of the shutter. By this means the source of light behind the film shines through the elements of a scene which should be exhibited in green and also passing through green glass produces an image on the screen of all the green elements of the picture. Similarly, images of all the red elements and images of all the blue elements ^{required} ~~shown~~ in their proper relation to each other in the picture, are produced on the retina of the beholder's eye in such rapid succession that all persist in the vision to form one picture.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming part of this specification, and embodying one form of my invention, and in which

Fig. 1 represents a detail view of a section of the film; the shutter, and part of the feed mechanism in section;

Fig. 2 represents a side elevation of the projecting machine, partly in section, and

Fig. 3 represents the image of the combined picture produced by the projection of three partial elements in

colors upon the screen.

Referring to Fig. 2, which represents conventionally the usual projecting machine, the film 1 is fed from the supply roll 2 through idlers 3, between sprocket 4 and idler 5, spring-pressed into contact with sprocket 4, to form the loop 6. The film then passes between idlers 7 and is fed on to take-up roll 8. 9 represents the shutter and 10 is the lantern box in which is the source of light. It will be understood that the above is given merely for the purpose of lucidity and that the invention could be embodied in any other form of projecting apparatus as well.

Referring to Fig. 1, the film 1 is provided with rows of perforations 11 as is shown and is fed by means of sprockets or feed-wheels 12, engaging these perforations, as is usual. The power is derived from the crank-shaft 13, gear 14 upon the crank shaft 13 meshing with pinion 15 on stud 16. Gear 17, also on stud 16 meshes with pinion 18, on intermediate shaft 19. 20 on shaft 19 and 21 on feed shaft 22, represent the intermittent feed which may be of any usual construction, as for example, the well-known Geneva stop mechanism. Bevel gear 23, on shaft 19 meshes with bevel-gear 24 on shaft 25, which carries the shutter 9 and provides a continuous rotation for the latter. The shutter is provided with portions, 26, 27, and 28, of transparent glass, or other material, of different colors. Between these transparent portions of the shutter, are opaque portions 29 and 30 and 31.

In the scene represented as thrown upon the screen in Fig. 3, the house 32 is shown, for example, in red, against a background of blue sky, 33, and green lawn, 34. On the film, in one section thereof the portion of the scene to be exhibited in green, that is to say, the lawn, 34

was left untouched, while the remainder of the section was painted out, or otherwise rendered opaque, as shown at 36. In the following section of the film, part of the scene to be displayed in red, namely, the house, 32, was left transparent, while the remainder of the scene was rendered opaque and in the following section of the film, the blue sky 33 was left while the remainder of the section was rendered opaque. The following sections of the film in the case of a motion picture, would be similarly treated.

In operation the film is so adjusted in the machine that the part of the scene which should be displayed in green, as for example, the green lawn in the foreground in the picture shown in Fig. 3, is caused to appear at the display opening 35 just as the section 26 of the shutter composed of green glass, is passing before the window 35. This image is displayed throughout the transit of section 26 across the window 35 and immediately upon the cutting off of the view by opaque member 27 of the shutter, the film is fed forwardly in the direction of the arrow, so that the succeeding section, showing the house 32, appears at the display opening just as transparent section 27 of the shutter which is red, begins to cross the display opening. Similarly, after this view has been cut off, section 33 showing the sky, appears at the display opening and is exhibited through the blue glass 28 of the screen. These three elemental images ^{register} ~~align~~ themselves in the vision of the beholder as is shown in Fig. 3, and are produced with such rapidity that the images of the first two sections shown, persist in the vision of the beholder while the third section is being exhibited, thus creating the illusion of a complete picture of a red house, against a back-ground of blue sky and green lawn. To produce

this effect successfully, the apparatus should be operated at a considerable rate of speed. It is of course understood that the invention is equally applicable to the projection of isolated views, having no motion or of views showing objects in motion. It is evident also, that in the example given in the drawings, the transparent sections of the shutter might have been any colors and might have been as well two or four or of another number other than three, although, of course, it is evident that if the number of views into which a picture is divided, is made too great, the speed with which the pictures would have to be taken in order to obtain views with practically no movement between the same for the different color elements and also the exhibiting of the same in the machine in order that the law of persistence of vision might be complied with, would be too great to be practicable. In the example shown, the objects are each shown in the solid color belonging to one transparent section of the shutter. It is, however, of course apparent that combinations of color may be formed on the retina of the beholder by the superposition of images of different colors upon the retina within the time limit allowed by the phenomenon of persistence of vision. For example, red and blue lights mingled, produced purple; red and green produce yellow; blue and yellow produce a pale pink, etc. Accordingly, with a shutter carrying transparent sections of green, red and blue, it would be possible to show a yellow object, for example, or yellow elements of the picture, by leaving the parts of the picture which should produce the yellow effect on the eye of the beholder, transparent in the sections of film which should be exhibited under the green and red sections of the shutter successively. For considerations

such as these, it is apparent that it is preferable to use for the shutter three transparent sections of those colors which as lights mingle together to produce white. It is apparent that it is possible, by my invention, to produce complete images of scenes in a great variety of shades and colors, by rendering opaque all those portions of the film in every section thereof which should not transmit the light of the color appropriate to that section and that by making the transparent portions of the film quite small, a showing of objects in many changing colors may be secured. With the apparatus shown in the drawings, the shutter is rotated one-third of a revolution for each successive forward feed of the film, one complete revolution of the shutter accompanying a forward feed of three pictures or sections of the film, which, however, produce only one complete picture in colors, equivalent to the usual instantaneous scene in black and white which accompanies the rotation of a shutter in the usual practice of the moving picture art.

It is apparent that the design of the shutter and the mechanical details of the apparatus disclosed in the drawings may be changed considerably without departing from the spirit of my invention. It is also evident that within the spirit of my invention it is not absolutely essential that a shutter be provided carrying transparent sections of different colored glass or similar material, ^{as shown} since any means might be employed to cause the transmission of light of the desired color through a transparent portion of the film at the proper time. Any means by which the light is, with a proper periodicity broken up into the desired colors, will be within the scope of my invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is as follows:

1. In a picture-exhibiting apparatus, a film carrying a series of transparent portions having the outline of parts of a scene, all of the parts of the series together representing the whole scene, and means for projecting in succession images of said transparent portions, at such a rate that the images first projected will persist in the vision to form with those last projected, an image of the complete scene, substantially as described.

2. In a picture exhibiting apparatus, a film composed of transparent portions and opaque portions, a series of transparent portions representing one complete scene, and means for projecting images of said transparent portions in succession with such alignment and at such a rate that the effect of the complete scene will be produced upon the eye, substantially as described.

3. In a picture projecting apparatus, a film partly transparent and partly opaque, a source of light, and means for aligning said transparent portions with respect to said source of light and advancing them past the same at such a rate that a single complete image will be formed on the eye as the resultant of the exposure of a series of said transparent portions, substantially as described.

4. In a picture projecting apparatus, a film partly transparent and partly opaque, a source of light, and means for periodically breaking up the same into various colors, and means for aligning said transparent portions with respect to said source of light, and advancing them past the same, the alignment being so timed that each said transparent portion is exposed simultaneously with

a change in the color of the light, and the advance being at such a rate that a single complete image of a scene in natural colors will be formed on the eye, as the resultant of the exposure of a series of said transparent portions, substantially as described.

3. In a picture projecting apparatus, a film comprising ^{andly} opaque portions and transparent portions, representing scenes to be projected, each scene being represented by a plurality of transparent portions, each of which represents that portion of the scene of a certain color, said transparent portions appearing on successive sections of the film, a source of light and means for periodically breaking up the same into various colors, and means for ^{requiring} ~~feeding~~ said transparent portions with respect to said source of light, and advancing them past the same, the ^{arrangement} ~~alignment~~ being so timed ^{said} that each transparent portion is exposed simultaneously with a change in the color of the light, and the advance being at such a rate that a single complete image of a scene in natural colors will be formed on the eye, as the resultant of the exposure of a series of said transparent portions, substantially as described.

28. In a picture projecting apparatus, a film carrying representations of scenes, each scene being disintegrated into its parts of one color each and each such part being carried by a successive section of the film, ^{source} ~~source~~ of light, means for periodically breaking up the same into various colors, and means for feeding said film past said source of light, so timed with respect to said first named means that each part of a scene will be exhibited in its proper color, and at such a rate that all the components of each scene blend in the vision of the beholder to form the complete scenes in their proper colors,

substantially as described.

7. In a picture projecting apparatus, a film carrying representations of parts of a scene and means for projecting images of the same in succession through media of different colors with such alignment and at such a rate that the resultant effect upon the eye will be the image of the complete scene in its natural colors, substantially as described.

8. In a picture projecting apparatus, a film carrying representations of a succession of scenes representing objects in motion, each scene being disintegrated into its portions, composed each of a different color and means for projecting images of the said portions of scenes in succession through media of different colors, each the color appropriate to the portion of a scene exhibited therethrough, with such alignment and at such a rate that the resultant effect upon the eye will be a succession of images of the complete scenes in their natural colors, substantially as described.

9. In a picture projecting apparatus, a film carrying representations of parts of scenes, a source of light, a frame provided with a display opening, a shutter provided with transparent portions of different colors and opaque portions, means for rotating said shutter continuously and means for feeding said film intermittently, said rotating means and said feeding means being so timed that a part of a scene will be displayed through said opening, through a transparent portion of said shutter of appropriate color and said film will be fed at such a rate that the images of all the parts of a scene will blend on the retina of the eye to form a complete image of the whole

scene in natural or desired colors, substantially as described.

10. In a picture projecting apparatus, a film comprising a plurality of successive sections, devoted to the portrayal of one scene, each of said sections being transparent or translucent as to those elements of the surface thereof corresponding to one elemental color in the scene portrayed, means for bringing said sections opposite a fixed point and means for projecting light through the same and through a coloring medium appropriate to each successively and with such rapidity that a resulting composite image of the whole scene in its proper colors will appear on the retina of the beholder's eye, substantially as described.

11. In a picture projecting apparatus, a film comprising a plurality of successive sections, devoted to the portrayal of one scene, each of said sections being transparent or translucent as to those elements of the surface thereof corresponding to one elemental color in the scene portrayed, and opaque as to all other elements of the surface thereof, substantially as described.

12. In a picture projecting apparatus, a shutter provided with a plurality of transparent portions of different colors and opaque portions between the transparent portions, a continuous film composed of transparent portions representing parts of scenes, and opaque portions, means for advancing said film past a window, a source of light behind said window, and means for advancing said shutter past said window, both said advancing means being so timed that a transparent portion of the film is exhibited opposite

said window at the same time that a transparent portion of
the shutter of appropriate color is advanced across the same,
substantially as described.

Insert in Claim 3.

Insert in Claims 4, 5 and 6. Nov 12, 1910.

Insert in " 4-6 6 12/11

This specification signed and witnessed this 10th day of August 1908

Thos. A. Edison

Witnesses:

1. Francis L. Ogden
2. Ogden Smith

Oath.

State of New Jersey } ss.,
County of Essex

THOMAS ALVA EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Orange, in the County of Essex and in the State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the improvements in

COLORED PICTURE EXHIBITING APPARATUS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 10th day of Aug 1908

Thos. A. Edison

Attest

Notary Public.

[Seal]

Fig. 1

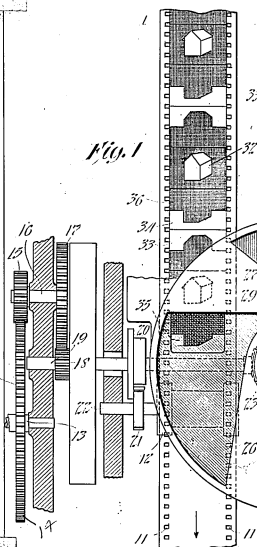
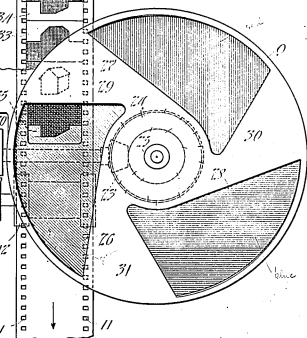
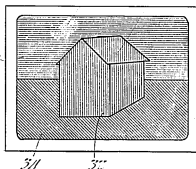


Fig. 3



Witnesses:
Frank C. Lewis
Byron Smith

Inventor:

Charles A. Lewis
By Charles A. Lewis
Attorney

423

188

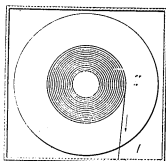
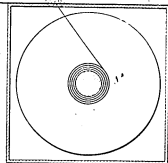
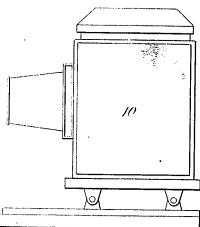
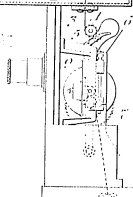
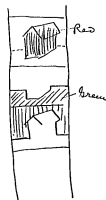
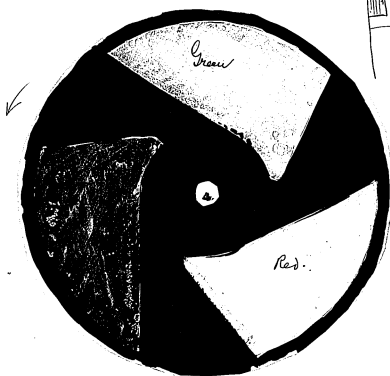


Fig. 2



Witnesses:
 Frank D. Lewis
 Dyer Smith

Inventor:
 M. J. P.



Oct 1st 1890 760

— Primary Colors —
 1st 2nd
 Red Red
 Green Green
 Yellow Blue

Edison 3 color projection
 on screen by means of colored
 shutters as above



423

2-260.

Div. 7 Room 312.
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

M. Paper No. 1
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.

Oct. 9, 1908.

Thomas A. Edison,
C/o Frank L. Dyer,
Orange,
N.J.



Please find below a communication from the EXAMINER in charge of your application.

Colored Picture Exhibiting Apparatus, filed Aug. 13, 1908, Serial
#448,292.

E. B. Moore.
Commissioner of Patents.

This case has been examined.

It is thought that the word "aligned", has been used in
the specification and claims in place of registered. The latter
is suggested as more accurate.

The statement contained in lines 5 to 8, of page 6, is ques-
tioned. A natural color picture of a scene containing red, blue,
and green could not be made with a two color screen.

The claims are rejected upon any of the following patents:

U.S. #645,477, March 15, 1900, Lee et al. (88-16);
U.S. #676,532, June 18, 1901, Davidson; (same class);
U.S. #690,766, Sep. 28, 1897, Korand; (83-18) (17);
British #249, Jan. 3, 1902, Vaughan; (88-17).

The applicant's film as set forth in the claims is precisely
what is obtained in the well known three-color process of color
photography, which is set forth as applied to moving picture
machines in the patents cited.

W.

Examiner.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)
COLORED PICTURE EXHIBITING)
APPARATUS) Room No. 312
Filed August 13, 1908)
Serial No. 448,292)

HONORABLE COMMISSIONER OF PATENTS,

S i R :

In response to rejection of October 9, 1908, please amend the above entitled case as follows:

✓ Page 1 of the Specification, line 14, cancel "aligned" and substitute - registered - . Line 22, cancel "align themselves" and substitute - register - .

✓ Page 3, line 18, cancel "aligned" and substitute - registered - .

✓ Page 5, seventh line from the bottom, cancel "align themselves" and substitute - register - .

✓ Cancel Claims 1, 2, 3, 4, 7, 8, 9, 10, 11 and 12.

✓ Claim 5, line 2, insert - solidly - before "opaque". Line 9, cancel "aligning" and substitute - registering - . Line 11, cancel "alignment" and substitute - registration - .

✓ Claim 6, line 4, after "film" insert - and
represented by a transparent or translucent portion of the film of the outline of the desired part, all the remainder of the section being solidly opaque - .

✓ Renumber Claims 5 and 6 as 1 and 2, and insert the following as Claim 3:

13
✓ 3. In a picture projecting apparatus, a film carrying representations of scenes, each scene being disintegrated into its parts of one color each and each such part being carried by a successive section of the film and represented by a transparent or translucent portion of the film of the outline of the desired part, all the remainder of the section being solidly opaque, substantially as described.

R E M A R K S

As to the Examiner's criticism of the statement contained in lines 5 to 8, page 6, it may be said that the remarks there, as stated, apply only to the example given in the drawings, that is, a picture in which the natural colors are not blended to produce all the shades possible in nature, but merely a picture composed of several integral portions of different colors.

The claims are thought allowable over the references and reconsideration and allowance are requested. All the references disclose the idea of taking the original pictures through revolving colored screens, and thereafter exhibiting the positives through the same colors. This is thought to be a mere theoretical scheme which is impractical, and in the present state of the art, inoperative. It is not possible to take an instantaneous picture with the requisite speed through red glass, for instance. Applicant's method is to take a series of ordinary black

and white motion pictures and then block out solidly all the portions of each scene other than those of the desired color. For example, in the case of the picture of a man wearing a green necktie, a blue shirt and a white collar, the portion of the film representing the white collar would be left transparent in all sections. In the section designed to appear under the green glass of the screen, all portions of the screen except the collar and the necktie would be blocked out. In the section intended to appear under the blue glass, all portions would be blocked out except the shirt and the collar. In the section intended to be shown under the red glass, all portions would be blocked out except the face and the collar. Thus, integral or complete portions of desired colors are left transparent or translucent, all the remainder being rendered solidly opaque. By this means a practicable method is designed, the necessary apparatus for which is now adequately claimed and distinguished from the references. Even if it were possible to properly take the negatives through the various colors as contemplated by the references, it would not be possible to solidly block out the portions which should be opaque and the powerful light of the arc would shine through the whole film to such an extent as to prevent the proper illusion.

Respectfully submitted.

THOMAS A. EDISON

Orange, New Jersey

By Frank L. Spu

October 7th, 1909.

His Attorney

423
Div. 7 Room 312

ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

2-280.

H. Paper No. 3

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

Nov. 15, 1909.

THOMAS A. Edison,
C/o Frank L. Dyer,
Orange,
New Jersey.



Exhibit
Please find below a communication from the EXAMINER in charge of your application.

Colored Picture Exhibiting Apparatus, filed Aug. 13, 1908, Serial
#448,292.

E. B. Williams

Commissioner of Patents.

Case reconsidered in connection with amendment of Oct. 8,
1909.

The reference numeral 14 should be added to Fig. 1 of the
drawings.

The claims are rejected on the references of record, in
view of

Grivolus (British), #10,695, May 23, 1901; (88--16).

Referring to Lee et al., #645,477 it will be noted that the
patentee takes pictures alternately through red, green, and
blue screens and then projects the pictures thus obtained
through a similar shutter. It is held that a film produced by a
machine of this type will have series of pictures thereupon, each
scene being disintegrated into parts of one color, each repre-
sented by transparent portions, all the remainder of the scene
being opaque. For instance, if a picture is taken through the
red screen of the shutter only those rays of light which are re-
lated to the red portion of the spectrum will pass through.

Consequently only those portions of the object which are in red
or having colors pertaining to red will be allowed to pass through
upon the sensitized surface of the film thus only those portions
will appear on the fixed film as transparent portions, and the
remaining of the picture corresponding to the portions of the
object which were green or blue will appear on the film as

opaque or nearly opaque. In the Lee structure it is probable that some light would passthrough the portions of the film which are supposedly opaque. It is held however, that in view of the fact that it is old to tint films by hand, that there would be no invention in re-touching the film, such as produced by the Lee apparatus to make the opaque portions of the film solidly opaque. The patent to Grivolus shows that it is old to project pictures from a black and white film through alternating red and blue color screens. It is admitted that in the Grivolus patent ~~that~~ the pictures are projected through color screens for a different purpose. However, if the observer lays aside his red and blue glasses he would see a picture on the screen which would be ~~in~~ color although the effect would not be pleasing.

S.

Examiner.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)

COLORED PICTURE EXHIBITING)
APPARATUS)

Filed August 13, 1908)

Serial No. 448,292)

Room No. 312.

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of November
15, 1909, please amend as follows:-

Please add the following claims:-

Cancelled 7/9/11, Invent B - claims 4-5
4. The process of making a photographic film consisting in photographing at spaced intervals upon a transparent film a series of images of an object or scene, preparing a positive film therefrom, and blocking out solidly all the portions of each image other than those representing the portion of the scene photographed of a certain color, different in each view, substantially as described.

not used
5. The process of making a photographic film consisting in photographing at spaced intervals upon a transparent film a plurality of series of images of a moving scene, preparing a positive film therefrom and blocking

out solidly all the portions of each image other than those representing the portion of the scene photographed of a certain color, different in each view of a series, and recurring periodically in the various series, substantially as described.

a 6. The process of presenting the illusion of animated scenes in color, consisting in photographing at spaced intervals upon a transparent film a plurality of series of images of a moving scene, preparing a positive film therefrom and blocking out solidly all the portions of each image other than those representing the portion of the scene photographed of a certain color, different in each view of a series, and recurring periodically in the various series, and projecting a series of images through said positive film in a moving picture projecting apparatus, each image being projected through a color medium appropriate thereto at such a rate that all the differently colored images of each series blend in the vision of the beholder to form the complete scenes in their natural colors, substantially as described.

REMARKS

The Examiner is requested to apply the reference numeral 14 to the gear mounted on crank shaft 13 in Figure 1 of the drawings, the said gear being shown in mesh with pinion 15 on stud 16.

Reconsideration and allowance are requested.
Claims 1, 2 and 3 have not been amended, since they are

thought to distinguish patentably in their present form. The patent to Lee No. 645,477 seems to be the only pertinent reference, and it is thought that the claims sufficiently distinguish from this. It would not be practically possible for one to retouch a film made by Lee's method, in which the picture is taken through variously colored screens, to obtain solidly opaque portions of the film, as claimed by applicant. Certainly, such a thing was not contemplated by Lee, and it is thought that invention is involved in the conception of such a method of procedure as applicant's. Many practical difficulties stand in the way of taking pictures at a rapid rate through variously colored screens, as contemplated by Lee. Applicant overcomes these difficulties by the simpler process of taking pictures of the whole scene in black and white, and later disintegrating the same into the various color elements by blocking out the portions of the picture corresponding to all except the parts of one color in the object photographed. The patent to Grivelus does not seem to be pertinent. Surely, he does not show a film having solidly opaque portions and transparent portions, as claimed by applicant.

It is thought that applicant has invented a new and true method in addition to his apparatus, and accordingly, the same is claimed in the three new claims submitted herewith. It is also thought that these claims are properly part of the same invention with the apparatus claimed because of the close connection between the same, which will be apparent to the Examiner.

Respectfully submitted,

THOMAS A. EDISON

November 14th, 1910

By

Frank L. Dyer
His Attorney

423

Div. 7 Room 312

2-260

M. Paper No. 5

Address only
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

Dec. 12, 1910.

Thomas A. Edison,

C/o Frank L. Dyer,

Orange,

New Jersey.



Please find below a communication from the EXAMINER in charge of your application.

Colored Picture Exhibiting Apparatus, filed Aug. 13, 1908, Serial
#448,292.

E. B. Moore.

Commissioner of Patents.

Case reconsidered as amended Nov. 15, 1910.

Claims 1 to 3 relate to an apparatus; claims 4 to 6 relate
to a process. Inasmuch as the claims originally made related
solely to apparatus, applicant is not now entitled to claim a
process in this application. Division is required: claims 4 to
6 must be canceled before action will be given on the merits.

Attention is called to the following patents:

(French) Joly, #383,074, Feb. 24, 1908;
(French) Joly, Addition, #8444, April 3, 1908;
(101--Stenciling machines, Band).

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)

COLORED PICTURE EXHIBIT-)
ING APPARATUS)

Room No. 312.

Filed August 13, 1908)

Serial No. 448,292)

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office letter of
December 12, 1910, please amend the above entitled appli-
cation as follows:-

Cancel Claims 4 to 6 inclusive, and add the
following claims:-

4. In a picture projecting apparatus, a film carry-
ing representations of scenes, each scene being disintegrat-
ed into its parts of one color each, and each such part
being carried by a successive section of the film and
represented by a transparent or translucent portion of the
film of the outline of the desired part, all the remainder
of the section having material applied thereto to render
the same opaque.

5. In a picture projecting apparatus, a film carry-
^{black and white}ing representations of scenes, ^{successive} (each) scenes being disintegrat-
ed into its parts of one color each, and each such part
being carried by a successive section of the film and
represented by a transparent or translucent portion of the
film of the outline of the desired part, all the remainder
of the section being covered with pigment to render the
same opaque, substantially as described.

R E M A R K S

In the above amendment applicant has complied with the requirement of division by canceling Claims 4 to 6 inclusive. Applicant reserves the right to file a divisional application on the subject matter of the claims canceled.

New Claims 4 and 5 are drawn along the lines of present Claim 3, and differ therefrom in including means for rendering certain portions of the film section opaque. None of the references of record shows moving picture films in which portions of the films have material applied thereto or are covered with pigment to render the same opaque. The Examiner is requested to consider the argument contained in the second paragraph of the remarks accompanying the amendment filed November 15, 1910 in connection with new Claims 4 and 5 as well as with Claims 1 to 3 inclusive previously in the case.

Favorable action on the merits of the claims now in the case is requested.

Respectfully submitted,

THOMAS A. EDISON

By

Frank L. Dyer

His Attorney

Orange, New Jersey

December 7th, 1911.

DIV. 7 Room 312

2-280

M. Paper No. 7

Address only
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON Jan. 26, 1912.

Thomas A. Edison,
C/o Frank L. Dyer,
Orange,



New Jersey.

Please find below a communication from the EXAMINER in charge of your application.

Colored Picture Exhibiting Apparatus, filed Aug. 13, 1908, Serial
#448,292.

E. B. Moore

Commissioner of Patents.

Case reconsidered as amended Dec. 8, 1911.

All the claims are rejected.

Attention is called to the office action of Nov. 15, 1911:

if the argument there is correct, it would appear that the films
produced by Lee and by applicant are the same so far as their
optical properties are concerned. The only distinction is that
in applicant's case a pigment is applied to the film to make
certain portions opaque, whereas in the reference precisely sim-
ilar portions are rendered opaque by an opaque emulsion. The Exam-
iner is unable to see how patentability can be predicated on a
change of this kind, where there is absolutely no change in the
result accomplished. It is true that the different method employ-
ed for making applicant's pictures necessitates this change in
the character of the opaque substance used; but this fact tends
to show novelty in the process rather than novelty in the arti-
cle. The fact that the process might be novel would be no rea-
son for granting a patent on the product, which in its optical
properties is identical with the article in the prior art. In
view of the above, all the claims are rejected on Lee, of
record.

#448,892-----2.

Attention is called to the following patents:

(French), Joly, #381,494, Jan. 13, 1908;
(French); Berthon et al., #564,569, Aug. 21, 1906;
(British), Krayn, #10,000, of 1900;
(French), Berthon et al., #375,110, July 1, 1907;
(French), Berthon et al. Ad. #6,193, Sep. 21, 1906;
(86--Color).

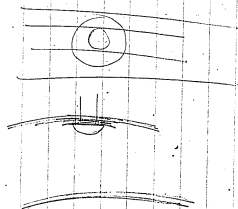
D.G.H.

Examiner.

4 The process of making a photographic film
consisting in photographing ^{at equal intervals} upon a transparent
film a series of images of an object or scene,
preparing a positive film thereon, and blocking out
so that all the portions of each image other than
those of a certain selected color, ~~are~~ ^{are} different in
each ~~series~~ ^{view} ~~subst~~ as shown

5 ~~plurality of series of images of a moving~~
scene, preparing a positive film thereon
and blocking out so that all the por-
tions of each image other than those
~~of a certain selected color, the~~
~~representing the portion of the scene photographed~~
of a certain color, different in each view
of a series, and recurring periodically in
the various series,

6 The process of presenting the illusion of animated
scenes in color, consisting in photographing at
equal intervals upon a transparent film a
plurality (as as 50-end) and projecting ^{series of} images
through said positive film in a moving picture
projecting apparatus, each image being pro-
jected through a color medium appropriate
thereto at such a rate that all the
~~different~~ ^{different} colored images of each series blend
in the vision of the spectator to form the
complete scenes in their natural colors.



Folio No. 436

Flying Machine

Serial No. 462,895

Applicant.

Address.

Thomas A. Edison

Orange N.J.

Title *Improvements in Flying Machines*

Filed *November 16, 1908* Examiner's Room No. *128*

Assignee *Thomas A. Edison, Inc.*

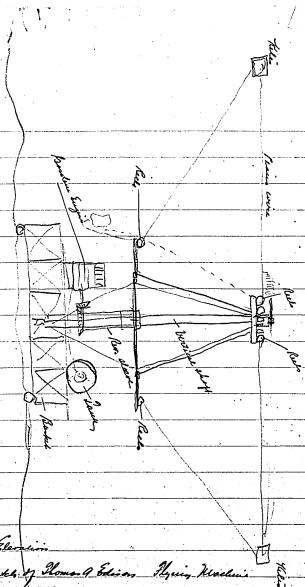
Ass'g't Exec. *June 30, 1916* Recorded *July 7, 1916* Liber *127* Page *52*

Patent No. *970,616* Issued *Sept. 20, 1910*

ACTIONS.

1	<i>Registered Feb. 8, 1909.</i>	16
2	<i>Approved Feb. 7, 1910.</i>	17
3	<i>Approved Apr. 20, 1910.</i>	18
4	<i>Final fee due Oct. 20, 1910.</i>	19
5		20
6		21
7		22
8		23
9		24
10		25
11		26
12		27
13		28
14		29
15		30

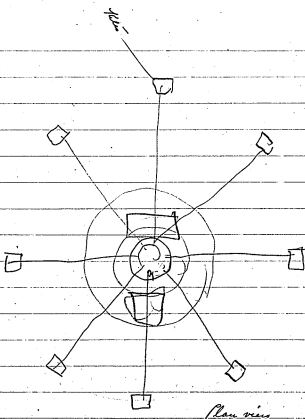
FRANK L. DYER,
Counsel,
ORANGE, NEW JERSEY.



#1 Elevator

Sketch of Roman's Edition Flying Machine

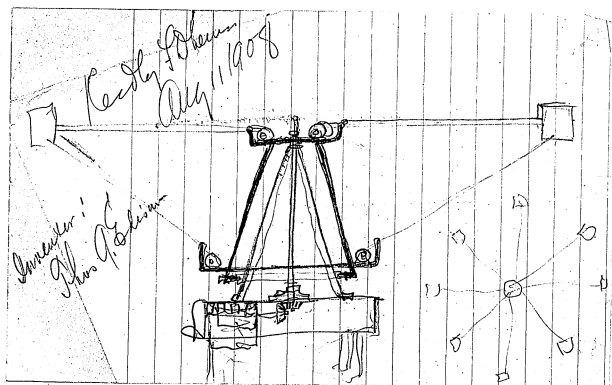
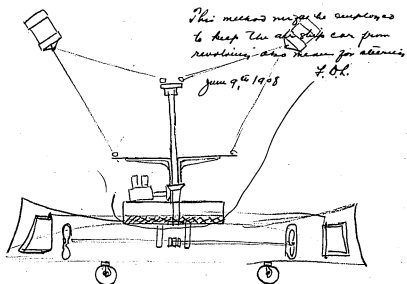
Read by James O. Lewis June 8, 1908

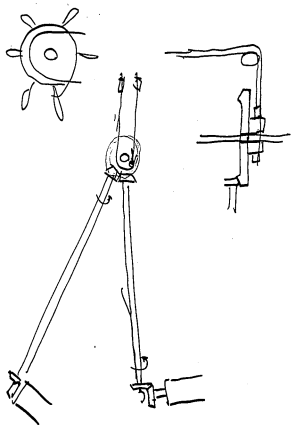


#2

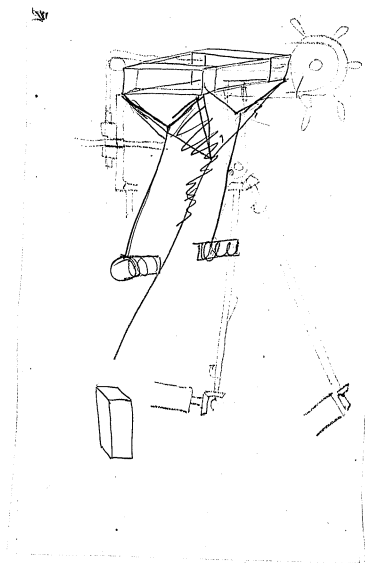
Sketch of Roman's Edition Flying Machine

Read by James O. Lewis June 8, 1908





[ON BACK OF PRECEDING PAGE]



Folio No. 428Serial No. 457.597

Applicant.

Thos. A. Edison

Address.

Orange, N. J.Title Cinograph Recorder. (Case E)Filed October 14, 1908. Examiner's Room No. 379

Assignee _____

Ass't Exec. _____ Recorded _____ Liber _____ Page _____

Patent No. _____ Issued _____

ACTIONS.

- 1 Registered October 28, 1908. 16
- 2 Amended October 27, 1909. 17
- 3 Registered Nov. 9, 1909. 18
- 4 Amended Nov. 5, 1910. 19
- 5 Registered Nov. 25, 1910. 20
- 6 Amended Nov. 9, 1911. 21
- 7 Registered Dec. 6, 1911. 22
- 8 Amended Nov. 15, 1912. 23
- 9 Final Registration Dec. 9, 1912. 24
- 10 _____ 25
- 11 _____ 26
- 12 _____ 27
- 13 _____ 28
- 14 _____ 29
- 15 _____ 30

FRANK L. DYER,
Counsel,

ORANGE, NEW JERSEY.

Dyn

1 as it is desirable to ~~increase~~ increase the amount of record on the surface, it is necessary that each surface should be hardened,

2 or other easily moulded material -

3 Resolator This -

I place the record upon a dipping mandrel having ^{adjustable} extension ends at each end of the record.

It is then immersed in the solution while held vertically. It is then withdrawn and subjected to a gentle breeze from a fan - to slightly offset or harden the surface. It is then immersed a second time & subjected to the air. If the solution is rather thick two brush dips will give a sufficient thickness of film over the record when the latter is done. Sometimes it is best to make the solution thinner when 3 or more dips will be necessary. After the dips the mandrel is transferred to a machine which rotates it in a horizontal position until ~~the~~ nearly free from

2

2

Solvent when it may be ~~planned~~ taken off the mandril & set aside until the whole of the solvent has evaporated leaving a very hard tough film on the surface of the record. It is a remarkable fact & entirely unexpected that although the average depth of the indentations on a record is only half of one thousandth of an inch, the greatest depth one thousandths of an inch. Yet if a film of the Nitrocellulose three thousandths of an inch when dry ~~is pressed upon a surface~~ ~~is~~ that a perfect replica of the record underneath is produced on the surface of the Cellulose above even to the finest detail & what is more strange is that the depth of the waves is so little affected that the loss in the Volume of Sound is scarcely noticeable. Very deep records can be made & the reproducing balls can be pressed with sufficient force against the Cellulose as to cause it

to follow the record without injury to it which would be impossible if the ball was forced against the record surface ~~be~~ - Thus the volume & quality of the sound can be increased & the sound record can be used indefinitely without noticeable deterioration.

Other film producing liquids may be used in place of the Nitrocellulose & its solvents such as Acetyl-Cellulose in acetic acid - If the Acetyl-Cellulose is used in the usual solvent Chloroform the solvent will generally attack wax & therefore the original record should be made of material which is not appreciably dissolved by the solvent of the film material.

Water soluble film producing substances can be used such as Silicate of Soda but in this case the surface of the recorded should be capable of being wet evenly as for instance by immersion.

the wax record in weak alcohol + rapidly drying this destroys the shining appearance of the surface of the record without hurting the record upon immersion in Dilute of Soda it will adhere evenly & upon drying will give a hard film. This can be made harder by immersion in Chloride of Calcium to form by double decomposition Calcium Silicate. The Silicate film is not so desirable as the Cellulose film not having toughness to withstand hard usage although very desirable in view of the cheapness of the material.

The adhesion of the film to the record is very great as they are shrunk under great tension & will withstand long use of the reproducing ball. The present in their adhesion to the contour of the sound record -

It is evident that for cheapening the film it may be adulterated with various cheaper materials soluble in the solvent which do not diminish the strength beyond the desirable point.

Claims - Phono record ~~now~~ coated with a tough hard film upon the surface of which is produced a replica of the record underneath, subso set forth -

2. A phono record of wax or waxlike ^{or similar} material coated over with a tough film upon the surface of which is a replica of the record underneath,

3. Phono record coated with a ^{nitro} Cellulose like film upon the surface of which is produced a replica of the record underneath.

6

How about Silicate soda & analogues

Should want get up a
process patent —

PAGE 2

(P)

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, Orange, County of Essex and State of New Jersey;

prays that letters patent may be granted to him for the improvements in

PHONOGRAPH RECORDS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Orange, New Jersey, his attorney, with full
power of substitution and revocation, to prosecute this application, to make
alterations and amendments therein, to receive the patent, and to transact all
business in the Patent Office connected therewith.

Thomas A. Edison

(P)

- SPECIFICATION -

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS ALVA EDISON,
a citizen of the United States, and a resident of Llewellyn
Park, Orange, County of Essex and State of New Jersey,
have invented certain new and useful improvements in
PHONOGRAPH RECORDS, of which the following is a description:

The wax-like compositions now in common use for
making phonograph records, such, for example, as that
described in Patent No. 782,375, granted to Jonas W. Ayls-
worth, have qualities which make them specially adapted
for this purpose. Such materials can be readily molded,
give an accurate copy of the surface of the mold or matrix,
and after being molded can be reamed out and trimmed off
and otherwise worked with great facility. Phonograph
records can be made from these materials at low cost, with
simple machinery and by very cheap labor. It is a fact,
however, that records made from these wax-like compositions
and made as is now the common practice, with substantially
one hundred record grooves to the inch, after being sub-
jected to a large number of reproductions on the phonograph,
show signs of wear and the character of the reproduction
obtained therefrom is not so good as at first. Obviously,
such records would be more rapidly worn if a narrower
record groove and a reproducing stylus of correspondingly
decreased size are made use of. As it is desirable to in-
crease the amount of record on the surface, it is necessary
that such surface should be hardened. It is desirable,

therefore, that a record be made which will have a harder and tougher wearing surface and which will at the same time retain the good moldable and workable qualities of the records made from the wax-like compositions now used.

The object of my invention is to provide a record of the sort just described, made from wax or wax-like composition, or other easily molded material, and having a hardened wearing surface. In the practice of my invention I preferably take a duplicate or original phonograph record, which has been made in any of the usual ways from the usual wax-like composition, and immerse it in a solution of nitrated cotton in any of the ordinary solvents used for this purpose, as for example, acetate of amyl, which is commonly made use of for providing a liquid solution from which films are made for photographic use. I may, if desired, add a small percentage of camphor to the nitrated cotton, thus making a celluloid collodion solution, but this may be dispensed with.

I place the record upon a dipping mandrel having adjustable extension ends at each end of the record. It is then immersed in the solution while held vertically; it is then withdrawn and subjected to a gentle breeze from a fan - to slightly affect or harden the surface; it is then immersed a second time and subjected to the air. If the solution is rather thick, two such dips will give a sufficient thickness of film over the record when the latter is dried. Sometimes it is best to make the solution thinner when three or more dips will be necessary. After the dips, the mandrel is transferred to a machine which rotates it in a horizontal position until nearly free from solvent, when

it may be taken off the mandrel and set aside until the whole of the solvent has evaporated, leaving a very hard tough film on the surface of the record. It is a remarkable fact, and entirely unexpected, that although the average depth of the indentations on a record is only half of one thousandth of an inch and the greatest depth one thousandth of an inch, yet, if the thickness of the film of the nitro-cellulose when dry is three thousandths of an inch, a perfect replica of the record underneath is produced on the surface of the cellulose above, even to the finest detail, and what is more strange is that the depth of the wave is so little affected that the loss in the volume of sound is scarcely noticeable. Very deep records can be made and the reproducing balls can be pressed with sufficient force against the cellulose as to cause it to follow the record without injury to it, which would be impossible if the ball was forced against the record surface below. Thus, the volume and quality of the sound can be increased, and the sound record can be used indefinitely without noticeable deterioration.

Other film producing liquids may be used in place of the nitro-cellulose and its solvents, such as acetyl-cellulose in acetic acid. If the acetyl-cellulose is used in its usual solvent - chloroform - the solvent will generally attack wax, and therefore the original record should be made of material which is not appreciably dissolved by the solvent of the film material. Water soluble film producing substances can be used, such as silicate of soda, but in this case the surface of the record should be capable of being wet evenly, as for instance, by immersing the wax record in weak alcohol and rapidly drying. This destroys the shiny

appearance of the surface of the record without hurting the record itself. Upon immersion in silicate of soda, it will adhere evenly, and upon drying will give a hard film. This can be made harder by immersion in chloride of calcium to form by double decomposition, calcium silicate. The silicate film is not so desirable as the cellulose film, not having toughness to withstand hard usage, although very desirable in view of the cheapness of the material.

The adhesion of the film to the record is very great as it is shrunk under great tension, and notwithstanding long use of the reproducing ball, it persists in its adhesion to the contour of the sound record. The thickness of the film may be governed by regulating the strength of the solution, a very dilute solution producing a thin film, as will be understood, and a stronger solution a thicker film. The film must obviously not be thick enough to interfere with the volume of sound produced by the record. It is evident that for cheapening the film, it may be adulterated with various cheaper materials soluble in the solvent and which do not diminish the strength beyond the desirable point. *Invent. A. Nov. 5 - 1910*

Having now described my invention, what I claim is:-

1. A phonograph record coated with a tough hard film upon the surface of which is produced a replica of the record underneath, substantially as set forth.
2. A phonograph record of wax or wax-like, or similar material, coated over with a tough film upon the surface of which is a replica of the record underneath, substantially as set forth.

3. A phonograph record coated with a nitro-cellulose-like film upon the surface of which is produced a replica of the record underneath, substantially as set forth.

*Send to the inventor of the
phonograph record
surface film*

This specification signed and witnessed this 10th day of October 1908.

Thomas A. Edison

Witnesses:

1. Oliver Halden

2. Frank R. Lewis

Oath.

State of New Jersey } ss.
County of Essex }

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Orange, County of Essex and State of New Jersey;

that he verily believes himself to be the original, first and sole inventor of the improvements in PHONOGRAPH RECORDS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Thomas A. Edison

Sworn to and subscribed before me this 10th day of October 1908.

A. R. Lewis

Notary Public.

[Seal]

2-260.

128
Div. 25... Room 579.
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

Paper No. 1-861
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

J. H. D. - Li.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,

October 28, 1908.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.

Please find below a communication from the EXAMINER in charge of your application.

for Phonograph Records, filed October 14, 1908, serial number
457,592.

E. B. Moore.

Commissioner of Patents.

Each of the ~~claims~~ is rejected in view of Adams-Randall's
British Patent #1058 of 1889, (181-2). See especially page 9,
lines 1, 2 and 3 of said patent.

If applicant prosecute this case further, he is requir-
ed to file a drawing of the article claimed, with the elements
constituting the record properly indicated by reference characters.

Lewis

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)

PHONOGRAPH RECORDS)

Filed October 14, 1908)

Serial No. 457,592)

Room No. 379.

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of October 28, 1908, please amend the above entitled case as follows:

Cancel the claims and substitute the following:

1. A phonograph record of ^{was 11/9/11} ~~suitable non-conducting~~ record ^{outer} ~~material~~ having vertical sound undulations on the surface thereof coated with an extremely thin tough hard ^{organic 11/7/11} film upon the surface of which is produced a replica of the record underneath, substantially as set forth.

2. A phonograph record of ^{was 11/9/11} ~~suitable material~~, having vertical sound undulations on the ^{outer 11/15/11} ~~surface~~ thereof, coated with a nitro-cellulose film, upon the surface of which is produced a replica of the record underneath, substantially as set forth.

REMARKS

Applicant will file a drawing of the article claimed, as requested by the Examiner, before the next Office action.

Reconsideration and allowance of the claims as now drawn are respectfully requested. The English patent to Adams-Randall discloses broadly the idea of protecting a sound record by covering the same with a thin layer. The following points should, however, be noted: The patentee applies a layer of plumbago to the surface of the wax or other record material. This is evidently for the purpose of making the same electro-conductive in order that metal may be deposited thereon electrolytically. The thin metallic varnish which the patentee refers to in line 2, page 9 of his patent, was apparently intended to be an electro-deposition like the layer of copper. It is impossible to get a thin electrolytic layer to form properly on a non-conducting record surface such as applicant's. Another distinction to be pointed out is that the record described by the patentee is one having lateral sound undulations. In such a case, it is not important whether or not the record groove is partially filled with the varnish or other protecting material. In the case of applicant's record, however, the undulations are vertical, and the same being on such a microscopic scale, the fact that a record may be made with a protective film covering the same and having a perfect replica of the record underneath on the surface of the film without noticeably affecting the depth of the wave, is quite remarkable and novel. Applicant discovered that this could be done with certain substances by operating in the proper manner, and the record here claimed is the embodiment of this discovery.

Respectfully submitted.

Orange, New Jersey
October 27th, 1909.

THOMAS A. EDISON

By *Edmund S. Coker*

His Attorney

428

Div. 23. Room 379

OFFICE OF THE
COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

J.H.D.-8.

2-280.

Paper No. 3,001

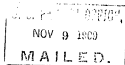
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

Nov. 9, 1909.

Thomas A. Edison,
Care Frank J. Dyer,
Orange, New Jersey.

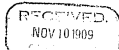


Please find below a communication from the EXAMINER in charge of your application,

for Phonograph Records, filed October 14, 1908, serial number
457,592.

E. B. Willard.

Commissioner of Patents.



This action is responsive to the amendment filed October
28, 1909.

Claim 1 is rejected as displaying no invention over
Connolly, Jan. 5, 1904, #749,030, (161-16).

The requirement for a drawing is repeated.

*Amended
Smith*

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison :
PHONOGRAPH RECORDS : Room No. 379.
Filed October 14, 1908 :
Serial No. 457,592 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of November 9, 1909, please amend this case as follows:

Page 4 of the specification, after the 21st line insert the following -

Attention is hereby directed to the accompanying drawing forming part of this application, and illustrating in partial longitudinal section a record embodying my invention. In the drawing, the record 1 which is formed, as stated, preferably of wax or wax-like composition, is provided with a vertically undulating sound record groove 2 having a hardened wearing surface provided by the film 3, which is formed of the substance or substances and in the manner described. -

R E M A R K S

Reconsideration and allowance are requested. Applicant has complied with the Examiner's requirement of a drawing. Claim 1, which has been rejected on patent

to Connolly, No. 749,030, has not been amended, and reconsideration and allowance of the same are requested. It is not understood what pertinence this reference can possibly have, and the Examiner is requested to explain the same. It may be that this reference has been cited by inadvertence, since it describes and claims a record of the laterally undulating record groove type, the record being formed of a soft metal by impressing or milling the record groove on the surface of the metal record, the surface of the record not being coated with a thin tough film upon the surface of which is produced a replica of the record underneath, as is claimed by applicant, nor coated in any other manner. This reference would give absolutely no instruction to one desiring to coat a protecting film upon the record surface of a record having vertical undulations. Since Connolly's record is formed of metal, he does not need a protective coating, and because of the manner of formation, his record could not be formed with vertical undulations.

Respectfully submitted,

THOMAS A. EDISON

By

Frank L. Dyer

His Attorney

Orange, New Jersey

November 5, 1910.

Div. 23 Room 379

Address only
"The Commissioner of Patents,
Washington, D. C."

J. H. D.-S.

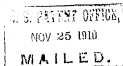
2-260

Paper No. 100,000
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

Nov. 25, 1910.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application.

for Phonograph Records, filed Oct. 14, 1908, serial number
457,692.

E. B. Moore

Commissioner of Patents.

This action is responsive to the amendment filed Nov.
8, 1910.

Claim 1 is again rejected upon Connolly of record, see
page 1, lines 74, 75 and 76. It is held immaterial whether
the coating be applied to a record having lateral grooves or
to one having vertical grooves as the same process is applicable
to either as see Wurth, Nov. 1, 1904, #773,617, (181-16), page 1,
lines 61 to 64 inclusive or Edison, Nov. 11, 1902, #713,209, (181-16),
page 1, lines 60 to 68 inclusive. This claim is also rejected
as not patentable over the product obtained by depositing the
thin coating of gold upon the master record as disclosed in this
last patent to Edison cited.

Claim 2 and also claim 1 are rejected upon Adams-
Randall of record, or Berliner, Nov. 8, 1897, #372,786, (181-14),
in view of Capps, Jan. 22, 1901, #666,493; Reynard, Jan. 29, 1901,
#666,819, or Manwaring, Nov. 8, 1904, #774,192, (181-16). It is
shown to be old in Berliner and Adams-Randall to apply a
protective coating to the surface of the record. It is held patent-
ably immaterial whether the record be one of the zig-zag grooves
or whether it be a hill and dale groove as it is believed that

#457,592-----2.

the application of the coating will not exterminate one groove more than the other. A section ^{transverse} to a zig-zag groove is analogous to a section longitudinally to a hill and dale groove. If Berliner's or Adams-Randall's protective coating is effective in their record grooves, it is believed the same coating would be as effective in a hill and dale groove .

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
PHONOGRAPH RECORDS,)
Filed October 14, 1908,) Room No. 379
Serial No. 457,592.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of November 25, 1910, please amend the above entitled case as follows:

In lines 1 and 2, claim 1, change "suitable non-conducting record material" to - wax - ; and in line 4, same claim, before "film" insert - organic - .

In line 1, claim 2, change "suitable material" to - wax - .

R E M A R K S

None of the references of record discloses a wax record having vertical sound undulations on the surface thereof and coated with a thin tough organic film bearing a replica of the record underneath. Adams-Randall employs for his surface coating a metallic varnish, a material which would produce a rough surface unsuited for efficient reproduction. Berliner makes no reference to the particular type of varnish applied to the record. Furthermore, the patents to Adams-Randall and Berliner disclose records having lateral undulations, whereas the

claims in this application specify that the record has "vertical sound undulations." Although the flow to the bottom of the grooves of a record of the first named type of the material forming the protective coating would not necessarily modify the shape of the sides of the grooves, so as to destroy the record, the use of the same material might cause such a flow to the bottom of the depressions of a record having vertical undulations as to practically destroy the efficient sound reproducing qualities of the latter. ^{2/3} A discovery of a method whereby a record having vertical undulations may be covered with a protective coating of organic material with the result that the depth of the grooves will not be noticeably affected is not suggested by any of the patents of record.

The patents to Connolly, Edison and Wurth of record specify metallic protective coatings and are accordingly thought not to suggest the applicant's invention. The patents to Capps and Reynard do not disclose a phonograph record of wax having vertical undulations on the surface thereof and provided with a protective coating bearing a replica of the record underneath.

Reconsideration and allowance are accordingly respectfully requested.

Respectfully submitted,

Orange, New Jersey,
November 9, 1911.

THOMAS A. EDISON,

By

Benjamin L. Dyck
his Attorney.

Div. 2 Room 379

2-280

Address only
"The Commissioner of Patents,
Washington, D. C."
J. H. D.-S.

Paper No. 7, 1911

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

Dec. 6, 1911.

Thomas A. Edison,
Care Frank T. Dyer,
Orange, New Jersey.

U. S. PATENT OFFICE,
DEC 6 1911
MAILED.

Please find below a communication from the EXAMINER in charge of your application.

for Phonograph Records, filed October 14, 1908, serial number
457,592.

E. B. Moore

Commissioner of Patents.

This action is responsive to the amendment filed Nov. 10, 1911.

Both of the claims are rejected upon the references and for
the reasons of record. It is held not a patentable limitation
that applicant has specified wax rather than any other well
known record material as the basic material of his record.
Moreover, both of the claims are rejected as met in terms by
the product produced by the dipping of Reynard's matrix. See
page 2, lines 57 to 61 inclusive.

It is believed that applicant is in error in saying that
Adams-Randall's record is laterally cut. The disclosure of the
sound box is clearly of the hill and dale type. Attention is
also directed to Hoyt, Aug. 14, 1906, #828,604; (181-16).

* Part of spec. mentioning waxes refers
to lateral cut.

See spec. in 40, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
PHONOGRAPH RECORDS,)
Filed October 14, 1906,) Room No. 379.
Serial No. 457,692.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of December 6, 1911, please amend the above entitled case as follows:

In line 2, claims 1 and 2 after "the"
insert - outer - .

R E M A R K S

The claims are thought not to be anticipated by the references of record and reconsideration and allowance are accordingly respectfully requested.

It is submitted that the use of wax as the basic material of applicant's record is of importance, this material having molding properties superior to those of the other well known sound record compositions and thereby producing a more accurate sound record than the last named materials. Referring to the Examiner's statement that both of the claims were met in terms by the product produced by the dipping of Reynard's matrix, it is pointed out that the record undulations of the said product are formed in the bore or interior thereof and could, therefore, not be conveniently reproduced. The claims have, however, been amended to differentiate from this product by specifying that the sound undulations are on the "outer" surface of the record. Reynard's record is furthermore not provided with a base of wax containing sound undulations, as specified

in both the claims, and the surfacing material specified by him is not nitro cellulose, as specified in claim 2, but "celluloid", which is a mixture of nitro cellulose and camphor.

Considering the other patents of record, none of these patents discloses a wax record having vertical sound undulations on the surface thereof and coated with a thin organic film bearing a replica of the record underneath. As stated in the remarks accompanying the last amendment, Berliner makes no reference to the particular type of varnish applied to the record, nor does he use a base of wax, and Adams-Randall employs a metallic varnish, a material which would produce a rough surface unsuited for efficient reproduction. Furthermore, both Adams-Randall and Berliner disclose records having lateral undulations, whereas the claims specify "vertical sound undulations". The patent to Hoyt, newly cited by the Examiner, does not disclose a record made of the material specified in the claims nor does it in any way indicate whether the record undulations are vertical or lateral. In connection with these references, attention is again directed to the remarks at the top of page 2 of the last amendment.

With reference to the Examiner's statement in the last paragraph of the last Office action re the Adams-Randall disclosure, it is pointed out that Adams-Randall distinctly states that the special record tablet described by him is intended for use with the form of recording apparatus disclosed in Fig. 45, which apparatus produces lateral record undulations. (See 5th and 6th

paragraphs, page 8 of Adams-Randall specification 1.

Respectfully submitted,

THOMAS A. EDISON,

By Frank L. Rogers
his Attorney.

Orange, New Jersey,

November 15, 1912.

Div. 23... Room 379-

Address only
"The Commissioner of Patents,
Washington, D. C."

J.H.D.-Sut.

2-280

Paper No. 9-11-11

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

Dec. 9, 1912.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.

U. S. PATENT OFFICE,
DEC 9 1912
MAILED.

Please find below a communication from the EXAMINER in charge of your application.

#457,592, filed Oct. 14, 1908, for Phonograph Records.

65-3211

E. B. Moore

Commissioner of Patents.

This action is responsive to the amendment filed Nov. 16,
1912.

Applicant is believed to be correct in his contention
that the disclosure in Adams-Pandall referred to of record, is
in relation to a laterally cut groove. But for reasons of
record, it is held patentably immaterial to which type of
record groove the coating is applied.

Both claims are rejected upon the references and for the
reasons of record.

Applicant's attention is directed to the decisions on
appeal to the Board of Examiner's-in-Chief in applicant's
prior applications serial numbers 421,884, 421,886 and 421,887,
as further explanatory of the grounds of rejection.

As a clear issue seems to have been reached between appli-
cant and this office the prosecution of this case is closed in
accordance with the ruling in ex parte Miller, 159, O.G., 730.

Folio No. 430

Serial No. 457,591

Applicant.

Thomas A. Edison

Address.

Orange, N.J.

Title

Rotary Dial

Filed

October 14, 1908

Examiner's Room No.

169

Assignee Thomas A. Edison, Inc.

Ass't Exec. June 30, 1910 Recorded July 7, 1910 Liber. 5127 Page 50

Patent No. 996,070

Issued June 27, 1911

ACTIONS.

1. Rejection Nov. 24, 1908 16
2. Amendment suggested Mar. 9, 1909 17
3. Amended March 16, 1909 18
4. Office letter Apr. 8, 1909 19
5. Amendment declared May 15, 1909 20
6. Finality Rejected Dec. 18, 1909 21
7. Amended Nov. 30, 1910 22
8. Allowed Jan. 5, 1911 23
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15. 30

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Reed May 24/08
S. L. Dyer
Dyer Patent May 25 1908

Reed, & Dyer May 27/08

The object of this invention is to increase the economy of burning Portland Cement Clinker -

The invention consists in interpolating at the feed end of a rotary kiln a regenerative wicker work of fire brick similar to a ~~regenerative~~ hot stove in blast furnaces, and arranging the channels so there shall be a minimum ~~friction~~ friction to the passage of the hot gases and a free space for the passage & progression of the fine powder

2

towards the clinking end of the kiln - so that instead of a single mass of fine material being exposed to the gas giving a very small surface relative to the mass for the absorption of heat this mass is divided into many parts due to the channels through the wicker work - Thus exposing a very large surface - hence the temperature of the gases which pass to the chimney is very much reduced by the absorption by the cold material in the wicker work & this heat is retained & passed on to the clinking zone ~~this~~ where less coal will be necessary

3

because the fine material enters the clinkery zone at a very much higher temperature.

There is also an additional reason due to the fact that the regenerated heat permits of the ~~coarse~~ fine material to be entirely carbonic practically all of the CO_2 being expected from it before it enters the Combustion Zone. This prevents CO_2 from entering the Combustion ^{in perspective} zone to disturb the rate of Combustion —

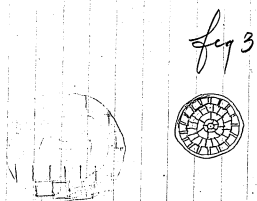
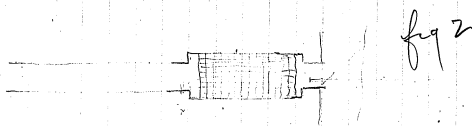
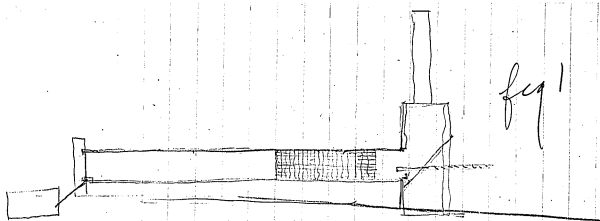
fig 1 shows 50 ft of regeneration wicker work within & revolving with the kiln — fig 2 shows the wicker work section of the kiln enlarged so that the friction of the gases is very little more than the empty kiln because it

4

is smaller — fig 3 wicker work — fig 4 Tile or hollow brick — fig 5 shows firebrick pipes instead of brick —

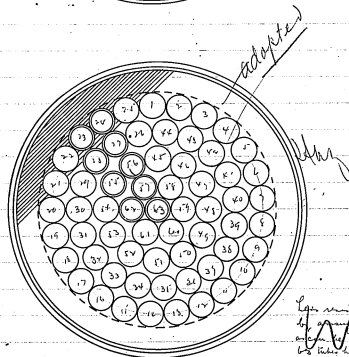
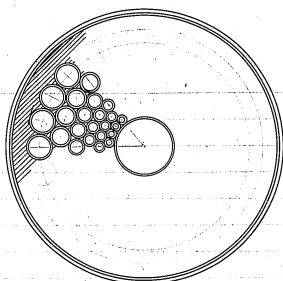
owing to the inclination of the kiln the stack will advance through the ~~tile~~ wicker work or tubes just as it does in the other part of the kiln —

102



11

1/2



Let's see how many of these
do you have in your
petri dish here

Let's see how many of these
do you have in your
petri dish here

1/2

Folio No. 439

Serial No. 463,943

Applicant.

Thomas A. Edison

Address.

Orange, N. J.

Title Water proofing material for concrete

Filed November 23, 1908

Examiner's Room No. 169

Assignee

Ass't Exec.

Recorded

Liber

Page

Patent No.

Issued

ACTIONS.

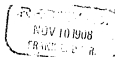
- | | | | |
|-----|---------------------------------|----|----------------------------|
| 1 | Supplementary Amendment Dec. 16 | 16 | Feb. 26, 1913 - Mr. Edison |
| 2 | Rejected Dec. 15, 1908 | 17 | instructed me to drop |
| 3 | Amended Dec. 13, 1909 | 18 | this case - See petition |
| 4 | Rejected Jan. 8, 1910 | 19 | page - HC |
| 5 | Amended Dec. 19, 1910 | 20 | |
| 6 | Rejected Jan. 17, 1911 | 21 | |
| 7 | Amended Jan. 13, 1912 | 22 | |
| ✓ 8 | Official Action Feb. 28, 1912 | 23 | |
| 9 | | 24 | |
| 10 | | 25 | |
| 11 | | 26 | |
| 12 | | 27 | |
| 13 | | 28 | |
| 14 | | 29 | |
| 15 | | 30 | |

VAULT

FRANK L. DYER,
Counsel,

ORANGE, NEW JERSEY.

Dye patent



The object of this invention is to produce a transparent flexible material for waterproofing Concrete -

The invention consists in dissolving pure Stearate of Aluminum in hot Petroleum Benzine in the proportion of 1 part of Stearate to 10 parts of Benzine and painting the Concrete, the evaporation of the solvent ~~leaves~~ leaves a thin transparent film of Stearate of aluminum on the surface of the pores for a considerable distance inward from the surface. This film has a negative capillarity & destroys the capillarity as far as water is concerned so it cannot penetrate,

The film is permanent & is not affected by Oxygen or other gases in the air & it does not tend to disintegrate the Concrete surface. Being transparent it preserves the natural color of the Concrete -

Stearate of Aluminum when dissolved in Benzine is very colloidal or jelly like. Even when a small quantity is used its covering power is enormous.

2

The minimum quantity used is two oz of stearate of Aluminum to one gallon of Petroleum Benzene - The amount may be increased but if the solution is to be very viscous a small quantity of Turpentine or acetate of amyl should be added to the Benzene to increase its solvent power & had the larger quantity in solution

Think it, now to use Stearate of Aluminum in a solvent to water proof Canvas also to Dissolve it in Petroleum Benzene also to increase the solvent power of Petroleum Benzene for the stearate of Aluminum by adding Turpentine, or acetate of amyl

Σ

Nov. 21, 1908

Hon. Commissioner of Patents,
Washington, D. C.

Dear Sir:-

Enclosed please find check for fifteen dollars,
(\$15.00) filing fee, together with specification in the
application of Thomas A. Edison, WATER PROOFING MATERIAL
FOR CONCRETE.

Yours very truly,

JMC/MH

General Counsel.

Enc.

Petition.

To the Commissioner of Patents:

Our Petitioner **THOMAS A. EDISON**
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, West Orange, County of Essex and State of New
Jersey.

prays that letters patent may be granted to him for the improvements in

WATERPROOFING MATERIAL FOR CONCRETE

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Orange, New Jersey, his attorney, with full
power of substitution and revocation, to prosecute this application, to make
alterations and amendments therein, to receive the patent, and to transact all
business in the Patent Office connected therewith.

Thos. A. Edison

S P E C I F I C A T I O N

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN that I, THOMAS A. EDISON, a citizen of the United States, and a resident of Llewellyn Park, West Orange, County of Essex and State of New Jersey, have invented a certain new and useful improvement in WATERPROOFING MATERIAL FOR CONCRETE, of which the following is a description:

The object of this invention is to produce a transparent flexible material for waterproofing concrete, Portland cement and similar substances.

The invention is carried out by dissolving pure stearate of alumina in hot petroleum benzine or other suitable solvent, and coating the concrete or other structure to be waterproofed therewith. The solvent used evaporates, leaving a thin transparent film of stearate of alumina on the surface of the concrete, and also on the surfaces of the pores of the structure for a considerable distance inward from the surface. This film so formed has a negative capillarity, and prevents the penetration of the substances by water. The film also is permanent, not being affected by oxygen or other gases in the atmosphere. It does not tend to disintegrate the concrete surfaces, and being transparent, furthermore, it preserves the natural color of the concrete. Stearate of alumina, when dissolved in benzine, as described, is a very colloidal substance, and the covering power of even a small quantity is enormous.

The minimum quantity of the stearate of alumina used is two ounces to one gallon of petroleum benzine. The

amount of stearate of alumina may be increased, but if the solution becomes very viscous, a small quantity of turpentine or acetate of amyl may be added to increase the solvent power of the benzine for the stearate of alumina, whereby a greater quantity of the latter may be held in solution.

Having now described my invention, what I claim and desire to secure by Letters Patent of the United States is as follows:

1. As a new article of manufacture, a waterproofing material comprising stearate of alumina and a suitable solvent, substantially as described.

2. As a new article of manufacture, a waterproofing material comprising stearate of alumina and petroleum benzine, substantially as described.

3. As a new article of manufacture, a waterproofing material comprising stearate of alumina, petroleum benzine and a ~~substance for increasing the solvent power of the petroleum benzine for the stearate of alumina~~ ^{solvent agent}, substantially as described.

4. As a new article of manufacture, a material for waterproofing concrete, etc., comprising stearate of alumina, substantially as described.

5. The method of making a waterproofing material which consists in dissolving stearate of alumina in hot petroleum benzine, substantially as described.

6. The method of making a waterproofing material which consists in dissolving stearate of alumina in hot petroleum benzine and adding a ~~substance for increasing the solvent power of the petroleum benzine for the stearate of~~ ^{solvent agent}.

alumina, substantially as described.

37. The process of waterproofing concrete which consists in applying a thin transparent film of stearate of alumina to the surfaces of the pores of the concrete for a considerable distance inward from the surfaces of the concrete, substantially as described.

*Substantially as described in claim 36
and in claim 37 of the
said patent in which process*

This specification signed and witnessed this 20th day of November 1908

Witnesses:

1. Eyer Smith
2. Anna R. Allen

Oath.

State of New Jersey }
County of Essex } ss.

THOMAS A. EDISON, the above named
petitioner, being duly sworn, deposes and says that he is a citizen of the United
States, and a resident of Llewellyn Park, West Orange, County of Essex,
State of New Jersey

that he verily believes himself to be the original, first and sole inventor of the
improvements in

WATERPROOFING MATERIAL FOR CONCRETE

described and claimed in the annexed specification; that he does not know and
does not believe that the same was ever known or used before his invention or
discovery thereof; or patented or described in any printed publication in the
United States of America or any foreign country before his invention or
discovery thereof, or more than two years prior to this application; or patented
in any country foreign to the United States on an application filed more than
twelve months prior to this application; or in public use or on sale in the
United States for more than two years prior to this application; and that no
application for patent upon said invention has been filed by him or his legal
representatives or assigns in any foreign country.

Sworn to and subscribed before me this 20th day of November 1908.

(Seal)
[Seal]

Thomas A. Edison
Anna R. Allen
Notary Public.

Recd Nov 27 1908

Pyre Smith

Dyer =

The patent application
on Stearate of Alumina
for Concreting. I made a
mistake & want to
amend it. Thus

"acid stearate of alumina"

instead of stearate of

Alumina —

Σ

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)
WATERPROOFING MATERIAL)
FOR CONCRETE)
Filed November 23, 1908)
Serial No. 463,943)

HONORABLE COMMISSIONER OF PATENTS:

S I R :

The applicant desires to add the following as a preliminary amendment to the above entitled case:

The applicant finds that through inadvertence it was not stated that the acid stearate is the salt with which the best results are attained. Applicant therefore desires to claim the use of the stearate of alumina generically, and the acid stearate of alumina specifically.

Please amend as follows:

Page 1 of the Specification, line 13, after "there-with." insert - The best results are attained by the use of the acid stearate of alumina, and I use the acid stearate in preference to the normal - . Same page, fifth line from the bottom, change "is" before "benzine" to - in - .

Please add the following claims:

- 8. As a new article of manufacture, a waterproofing material comprising acid stearate of alumina and a suitable solvent, substantially as described.

9. As a new article of manufacture, a waterproofing

material comprising acid stearate of alumina and petroleum benzine, substantially as described.

10. As a new article of manufacture, a waterproofing material comprising acid stearate of alumina, petroleum benzine and a substance for increasing the solvent power of the petroleum benzine for the acid stearate of alumina, substantially as described.

11. As a new article of manufacture, a material for waterproofing concrete, etc. comprising acid stearate of alumina, substantially as described.

12. The method of making a waterproofing material which consists in dissolving acid stearate of alumina in hot petroleum benzine, substantially as described.

13. The method of making a waterproofing material which consists in dissolving acid stearate of alumina in hot petroleum benzine and adding a substance for increasing the solvent power of the petroleum benzine for the acid stearate of alumina, substantially as described.

14. The process of waterproofing concrete which consists in applying a thin transparent film of acid stearate of alumina to the surfaces of the pores of the concrete for a considerable distance inward from the surfaces of the concrete, substantially as described.

15. As a new article of manufacture, a waterproofing material comprising an acid salt of alumina and a suitable solvent, substantially as described.

Respectfully submitted.

THOMAS A. EDISON

Orange, New Jersey

By

Frank L. Dyer

December 3, 1908

His Attorney

4-209

Div. 31 Room 169
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-280.

Paper No. 2
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

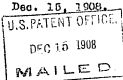
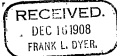
MDE

WASHINGTON, D. C.

Dec. 16, 1908.

Thomas A. Edison,

C/o Frank L. Dyer,
Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

No. 463,943, Waterproofing Material for Concrete, filed
November 23, 1908.

E. B. Moore

Commissioner of Patents.

The amendment of December 5, also claims 8-15, should be cancelled, because constituting new matter not contained in the original specification.

Claims 1-4 should be drawn to a composition of matter in place of a new article of manufacture.

Claims 3 and 6 are rejected because describing one of the ingredients by its function.

Claim 7 is rejected as non-patentable being drawn to the obvious use of the composition. If it were a proper process claim of waterproofing, division would be required between it and the other claims.

There appears to be nothing patentable in the case over Wharton (British) 15,029 of 1901 (134-13) and claims 1, 2, 4 and 5 are rejected thereon. *J. A. E. Pen*

Claims 8-15 are rejected as being based on new matter.

Attention is also directed to

Mitchell, 327,813, October 6, 1885,

Bastet, 361,841, April 12, 1887,

Thornton et al., 654,688, July 31, 1900,

(134-11),

Turner (British), 13,931 of 1898 (134-26), *J. A. E. Pen*

McInnes (British), 259 of 1895 (134-26). *J. A. E. Pen*

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison :
WATERPROOFING MATERIAL FOR :
CONCRETE : Room No. 169
Filed November 23, 1908 :
Serial No. 463,943 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of December 15, 1908, please amend this case as follows:

✓ Page 1 of the specification, cancel the amendment after "thencewith" line 13, made December 3, 1908.

✓ Cancel Claims 1, 2, 4, 5, 8 to 15 inclusive.

✓ Claim 3, line 1, Substitute - As a composition of matter - for "As a new article of manufacture". ✓ Lines 3 and 4, cancel "substance for increasing the solvent power of the petroleum benzine for the stearate of alumina" and substitute - thinning agent - . ✓ Renumber this claim as 1.

✓ Claim 6, lines 3, 4 and 5, cancel "substance for increasing the solvent power of the petroleum benzine for the stearate of alumina", and substitute - thinning agent - . ✓ Renumber this claim as 2 and renumber Claim 7 as 3.

REMARKS

Reconsideration and allowance of the claims as amended are respectfully requested. The Examiner's objection of new matter as to certain claims has been met by cancelling the same, and various other claims rejected have also been cancelled. Claim 1, drawn to a new composition of matter, and Claim 2, drawn to a method for making the same, are not met in the references. No reference discloses the ingredient of a thinning agent in combination with the other ingredients, nor the method of making a waterproofing material in which stearate of alumina is dissolved in hot benzine and the thinning agent for the composition added. The term "thinning agent" is thought to be a generic term describing an ingredient of the kind disclosed in the specification and having the property of thinning the composition or increasing the solvent power of the benzine for the stearate of alumina. This is a perfectly proper way to claim an ingredient, just as it is proper to claim broadly means for performing a certain function in a claim for a mechanism.

Claim 3, previously 7 is also thought to be patentable. None of the references disclose a process for waterproofing concrete. It is thought not to be obvious that the process of waterproofing textile materials and the like described in some of the references would be equally applicable to concrete. The situation is entirely different, and applicant has discovered that the composition invented by him may be applied to concrete

in such manner that, the solvent evaporating, a thin transparent film of the stearate of alumina is left, not only on the surface of the concrete, but also penetrating the pores of the structure for a considerable distance inward from the surface, this film so formed having a negative capillarity, and thereby preventing the penetration of the substance by water. It would likewise seem that that is an integral invention with that claimed in the other claims, and division should not be required.

Respectfully submitted.

THOMAS A. EDISON

By

Frank A. Ryan

Attorney

Orange, N. J.

December 13th, 1909.

439

Div. 15. Room 308

ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

2-280.

AS

Paper No. 4

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

Thomas A. Edison,

WASHINGTON, D. C.,

Jan. 8, 1910.

c/o Frank L. Dyer,

6

Orange, N. J.

Please find below a communication from the EXAMINER in charge of your application,

for WATERPROOFING MATERIAL FOR CONCRETE, filed Nov. 23, 1908,
#463,943.

E. B. Mott

Commissioner of Patents.

This case considered as amended Dec. 14, 1909.

The claims are rejected on the reference, Wharton, of record, also

Lowrey, #89,055, Apr. 20, 1869 (134 - 39)

which shows the precipitation of an alum soap which is either stearate oleate or palmitate of aluminum, and the solution of this in different solvents or a mixture of them which includes the applicant's solvents for the same use as the applicant's composition. The heating to produce solution is obvious and immaterial.

*confined
limits*

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
WATERPROOFING MATERIAL)
FOR CONCRETE.)
Filed November 23, 1908.) Room No. 169.
Serial No. 463,943.)

HONORABLE COMMISSIONER OF PATENTS,
S I R:

In response to the Office action of
January 8, 1910, please amend this case as follows:

Cancel claim 3.

Add the following claims:

3. A composition of matter for waterproofing,
consisting of, *namely, stearate of alumina* dissolved in petroleum
benzine and turpentine, substantially as described.

4. The method of making a waterproofing material
which consists in dissolving stearate of alumina in
hot petroleum benzine and adding turpentine, substantially
as described.

REMARKS.

Reconsideration of claims 1 and 2 is requested.
These claims together with new claims 3 and 4, are believed
to be patentable because none of the references show a
composition of matter made up of the three substances,
namely, stearate of alumina, petroleum benzine, and
turpentine, or other thinning agent; ^{and} none of the references

show a method of making a waterproofing material by dissolving stearate of alumina in hot petroleum benzine and adding turpentine, or other thinning agent. By the use of both petroleum benzine and turpentine, applicant secures the combined advantage of a cheap material such as benzine, and a material of great solvent capacity, such as turpentine, in making a waterproofing material.

Reconsideration and allowance of the case as amended is requested.

Respectfully submitted,

THOMAS A. EDISON

By

Frank L. Dyer

His Attorney.

Orange, New Jersey,

December 19 1910.

Div. 15 Room 3-08

2-280 AS

Paper No. 6

Address only
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

Thomas A. Edison, WASHINGTON Jan. 17, 1911.

c/o Frank L. Dyer,

Orange, N. J.

139
Please find below a communication from the EXAMINER in charge of your application.

for WATERPROOFING MATERIAL FOR CONCRETE, filed Nov. 23, 1908,
#463,943.

E. B. Moore

Commissioner of Patents.

This case considered as amended Dec. 20, 1910.

Lowrey shows both benzine and turpentine as solvents. The
use of both would be obvious and unpatentable.

The claims are rejected.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison

WATERPROOFING MATERIAL
FOR CONCRETE

Filed November 23, 1908

Serial No. 463,943

Room No. 169.

HONORABLE COMMISSIONER OF PATENTS.

S I R :

In response to the Office action of
January 17, 1911, please amend the above entitled appli-
cation as follows:-

Rewrite Claim 1 as follows:-

1. As a new composition of matter, a waterproofing
material comprising substantially pure stearate of alumina,
petroleum benzine, and a thinning agent, substantially as
described.

Claim 3, line 2, before "stearate" insert -
substantially pure - .

Add the following claims:-

5. The method of making a waterproofing material,
which consists in dissolving substantially pure stearate
of alumina in hot petroleum benzine, and adding a thinning
agent, substantially as described.

6. The method of making a waterproofing material,
which consists in dissolving substantially pure stearate
of alumina in hot petroleum benzine, and adding turpentine,
substantially as described.

R E M A R K S

In the Lowrey patent there is no disclosure of the use of substantially pure stearate of alumina, as is set forth in Claims 1, 3, 5 and 6, or that step of the process which consists in dissolving stearate of alumina in not petroleum benzine and adding a thinning agent, as is set forth in Claims 2, 4, 5 and 6. The disclosure of the Lowrey patent is very indefinite, because the ingredients used are not set forth with sufficient definiteness. Lowrey proposed to dissolve soap in water and then add any one of a number of substances possessing a saline quality, such as any alums, sulphates or acetates, either alone or in combination with any chlorides. There are, of course, many different kinds of soaps, and there is no evidence that the soap used by Lowrey contained a stearate. Lowrey considered it to be immaterial which of the many salts mentioned he used. Applicant has discovered that the best results for the purpose described are obtained by the use of a substantially pure stearate of alumina. Furthermore, a satisfactory product could not be obtained by the use of many ^{of the} substances included under the general terms used by Lowrey to denote the ingredients he proposes to use. Lowrey's patent does not disclose the use of a substantially pure stearate of alumina, and the gum prepared by his process would certainly contain other substances.

It is believed that Lowrey's patent does not constitute an anticipation of applicant's invention, and that the claims are clearly patentable.

Reconsideration and allowance are requested.

Respectfully submitted,

THOMAS A. EDISON

Orange, New Jersey

By

Frank L. Alger

January 13, 1912

His Attorney

Div.15. Room.....308

Address only

"The Commissioner of Patents,
Washington, D. C."

2-200

AS

Paper No. 8

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

Feb. 28, 1912.

Thomas A. Edison,

c/o Frank L. Dyer,

Orange, N. J.

Please find below a communication from the EXAMINER in charge of your application.

for WATERPROOFING MATERIAL FOR CONCRETE, filed Nov. 23, 1908,
#463,943.

E. B. Moore

Commissioner of Patents.

This case considered as amended Jan. 15, 1912.

The new claims 5 and 6 are substantially identical with
claims 2 and 4, respectively.

Where a compound is designated by a definite chemical name,
the substantially pure ~~amalgam~~ compound is meant.

Lowry, of record, shows the use of an aluminum soap, which
must contain a mixture of the stearate, palmitate and oleate of
aluminum and in view of the condition of the soap making industry at
the time of the issue of Lowry's patent it would be most remarkable
if the soap used did not contain stearate. Furthermore, the term
"soap" applies to a pure stearate soap, and hence the "gum" of Lowry
may be a pure stearate of aluminum, as pointed out in the office
letter of Jan. 8, 1910.

The use of a mixture of known solvents where no new function,
except great cheapness is gained, is obvious and unpatentable.

Heating to hasten solution is also a well known, obvious
step in the production of solution.

As a clear issue appears to have been reached, and appli-
cant has made only immaterial amendments, the previous action is re-
peated and may be considered final, if applicant desires.

B. S.
 John C. Wilson, Secretary of the
 Board of Education, New York City, N. Y. (Presented by the Board)

Article Stearate of Aluminium in Solvent.
Method of Making -
" " Using ?

CH_3COCH_3 $\text{C}^{\text{O}}\text{H}^{\text{O}}$
 (C₂H₄O₂)

~~Acetic ester - acetyl chloride mixture.~~
Turpentine, $C^{10}H^{16}$ - Essential oil slowly
absorb oxygen from air. Dividing Bengal ~~oil~~

Amylacetate $\frac{C^5H^{11}C^2H^3O^2}{\text{Compound ester -}}$

Benzine - Saturated Hydrocarbon

Folio No. 440

Serial No. 464410

Applicant.

Thomas A. Edison

Address.

Orange, N.J.

Title Means for utilizing the static electric force

Filed November 25, 1908 Examiner's Room No. 308

Assignee Thomas A. Edison, Inc.

Ass't Exec. James B. Clark Recorded July 2, 1915 Liber 7127 Page 50

Patent No. 1,149,552 Issued Aug 3, 1915

ACTIONS.

- | | |
|--|---|
| 1 <u>Rejected Jan 13, 1909.</u> | 16 <u>Letter to Office Dec 15/14</u> |
| 2 <u>Amended Jan 7, 1910.</u> | 17 <u>allowed Jan. 7-1915</u> |
| 3 <u>Rejection Jan 22, 1910.</u> | 18 <u>Final Fee due July 7-1915</u> |
| 4 <u>Amended Jan. 3, 1911</u> | 19 <u>Amended under Rule 28 June 27, 1915</u> |
| 5 <u>Revised Feb. 4, 1911.</u> | 20 <u>Amendment Rejected July 2, 1915</u> |
| 6 <u>Amended Feb. 2, 1912.</u> | 21 <u>Final Fee paid July 7, 1915</u> |
| 7 <u>Office letter Mar. 6, 1912.</u> | 22 _____ |
| 8 <u>Amended October 24, 1912</u> | 23 _____ |
| 9 <u>Rejected Nov. 20 - 1912.</u> | 24 _____ |
| 10 <u>Amended Nov. 15, 1913</u> | 25 _____ |
| 11 <u>Rejected Dec. 16 - 1913</u> | 26 _____ |
| 12 <u>Amended Oct. 9 - 1914</u> | 27 _____ |
| 13 <u>Office letter Nov. 10 - 1914</u> | 28 _____ |
| 14 <u>Amended Nov. 13 - 1914</u> | 29 _____ |
| 15 <u>Office letter Dec. 9 - 1914</u> | 30 _____ |

VAULT

FRANK L. DYER,
Counsel,
ORANGE, NEW JERSEY.

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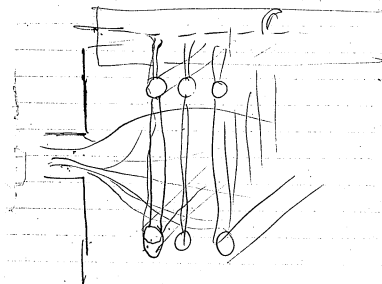
The object of this invention is to utilize the waste hot gases from rotary ~~Portland Cement~~ Kilns, for the generation of steam, in such a manner that the dust which accompanies the process shall be prevented from interfering with successful operation.

The invention further consists in utilizing the waste gases from a ~~Portland Cement~~ Kiln to generate steam without any alteration of the draft of the Kiln ~~or the~~ naturally occurring. The engine utilizing the steam may operate or not ~~as required~~.

The invention further consists in various details in combination to carry out the invention —

000

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K The Kibn

SK Kibn Stack

KD Chamber holding stack

Mn incline plate carrying ^{any} dust which may settle in the Chamber KD to the screw conveyor KE

KE is a screw conveyor at the rear of the whole battery of Kibns or it receives any dust which settles in Chamber KD and also from the large dust settling Chamber X

The dust being conveyed to KE by a screw conveyor S which runs under X its full length -

at the extreme end of screw Con KE is an Elevator not shown which delivers all dust thus collected into the general conveying system that carries raw material to the Kibns

KE also receives any dust that may settle in the hot air pipe H which carries the hot gases to X. when in use G G' & pipes KF KF' permit cleaning the pipe of dust at intervals or continuously

DD is a dumper cutting off X

FX is a dumper cutting off stack SK when X is working should it be necessary to repair anything in the Chamber X DD is closed & FX opened -

g one grids of stream pipes - see fig 2

These are constructed in the ordinary manner there may be as many as 40 sections or grids to the ~~stack~~ Chamber X -

There are 2 drums to each Kibn the Chamber

2

X being divided into two sections see fig 3

Q Q' are steam drums ~~at top~~ of the chamber

+ $\frac{1}{2}$ of the steam grids are connected to each—

These drums are connected to the main

Steam pipe Mm controlled by Valves,

The type of gang of pipes is shown in fig 4

Each grid may be blown off ~~each~~ but it

preferable to connect the blow off legs of

several grids or all the grids connecting

with one steam drum together to a single

horizontal pipe + use a single valve to

blow it off in a large blow off pipe

as the horizontal pipe connects to all

the legs it moves up & down when the

grid pipes expand & contract. The grids

themselves being free at the lower end

there is no trouble from expansion

There will be less trouble from the joints

than in a regular boiler as the temperatures
of the gases do not go above a red heat.

nc fig 3 is a baffle so

To get room for the drums so they will not be over the grids of pipes. The tubes do not extend as close to the side walls of the center partition of X as on the sides. The baffle causes the gases to pass thru the tubes. The effect of having no tubes under the drum is to permit the withdrawal of any or all the tube grids without removing the drum & also to clean any tube of scale.

fig 6 shows top view of the arrangement.

When the dust collects in sufficient quantity but not enough to reach the bottom drum of the pipe grid the attendant partially unloads the dust from various sections one at a time by putting gates H.F.

The tubes being vertical do not collect dust only at the top of the bottom drum but the amount is small & it reaches a certain point & unloads itself automatically -

4=

4

Over the top of the steam dust chamber X is a corrugated non-rail but no sides - ~~that is a reasonable section of the roof~~ permit a section or grid to be raised out of the chamber vertically.

A number of attempts have been made by various experimenters to utilize the waste gases from Cement Kilns but they were not constructed properly to ~~take care~~ obviate the trouble due to dust & the generation of steam being variable caused serious disturbances of the draught of the kiln so that more was lost in the economy & output of the kiln than was gained in the utilization of the gases.

It will be seen that the trouble with dust is obviated in my invention.

Regarding the conveyance of draught

I attain this by ~~generating~~ Evaporating the same amount of water, whether it is utilized or not by the Engine, by means of an automatic blow off or safety Valve + Muffler. The ~~steam~~ ^{steam} utilized by the Engine should always be less than that generated so there is nearly always a constant loss of steam through the safety Valve. It is probable that 85 to 90 percent of the steam generated can be practically utilized by the Engine without in any way disturbing the draught of the Kiln.

If the Engine is stopped, the steam generated by the Kiln must be the same otherwise the temperature of the gases will change & the draught will change greatly making it impossible to control the Kiln reactions.

~~Of course a forced draught~~ If forced draught is used there will still be a disturbance as the gases if hotter are expanded more & the exhauster

6

have to be speeded up to pass the same amount of free air into the extreme or exit end of the kiln. There seems no way to solve the problem ~~except by~~ of a non disturbance of the regular kiln draught except to generate a constant quantity of steam & utilize as much as possible.

The height of the chimney on the dust chamber is made higher ^{than the kiln stack} & larger so the draught will be the same notwithstanding the friction of the ~~chamber~~ ^{gas} gases meet in passing thru the chamber.

Thus if we shut off the dust chamber & operate the kiln stack there will be no disturbance of the kiln draught,

~~I am not sure that the furnace~~
~~previous use of this connection & combined~~
~~steam generating device directly with a~~
~~dust settling chamber~~

Mem

(What I think is new —

7

- A separate dust chamber from a Cement Kiln in addition to the usual chamber & of simple proportions to settle the dust on modern kilns when driven for large outputs with means of removing the dust automatically by a conveyor system to the kilns again - with an additional stack whereby the dust chamber can be operated or not permitting of repairs being made without stopping operation of the kiln.
- 2nd Combining with a dust chamber of steam generating appliances which are free from troubles due to expansion & collection of dust, capable of easy cleaning & removal.
- 3rd ~~generating~~ Evaporating a constant volume of water into steam at any given pressure & utilizing such an amount in a steam engine & wasting such another amount as will keep the draught of the kiln ^{and} constant ~~to such an extent~~ as if no steam was generated & the kiln was worked in the ordinary manner.

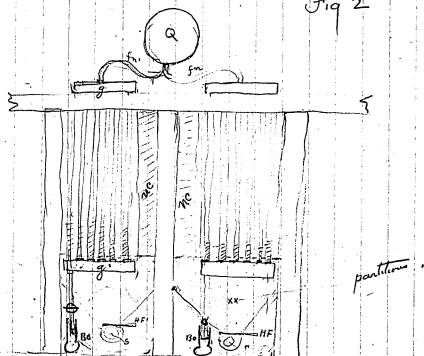
4th = forming a steam generator of several
several units of pipes ~~hanging~~ hanging
vertically in the chamber & fixed at the
✓ top to ~~be~~ free to expand & connect
several units to a steam
drum - & also providing a blow off at
the bottom,

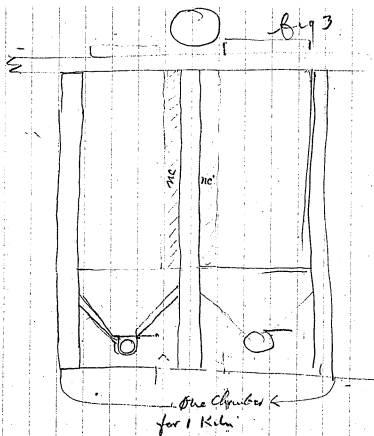
5th = Connecting the two chambers together
by a passage which will unload ^{the} dust
its dust to a conveying system
automatically -

6th = Dividing the dust chamber into 2
parts, so as ~~that the height is~~ to diminish
✓ the width of the steam sections &
also to diminish the height of the
chamber by using 2 unloading screws
~~the~~

7th the use of partitions across the divided
chamber a short distance up & just
✓ beyond the bottom of the tube grids whereby ^{the} the
the gases must pass around the pipes -

Fig 2





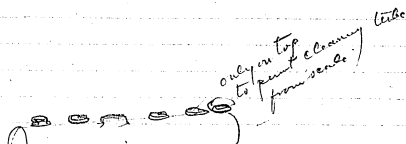
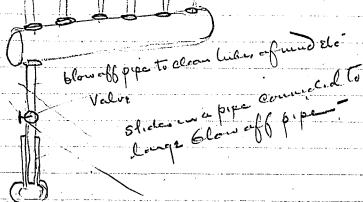
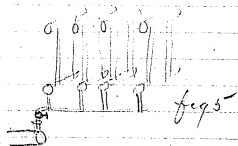
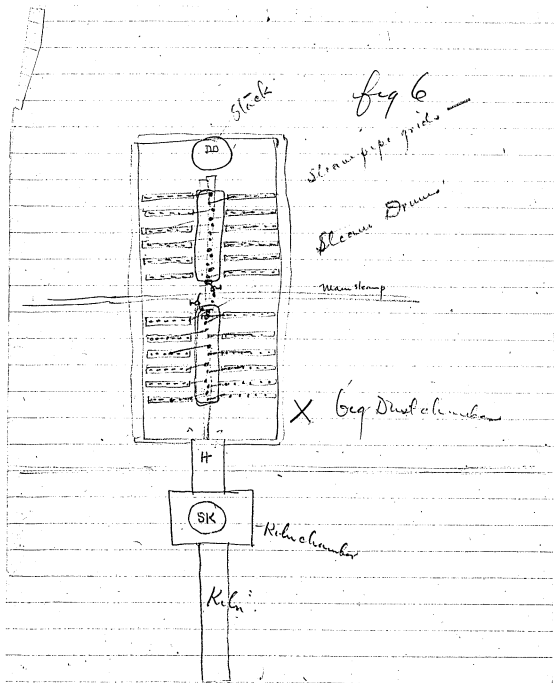
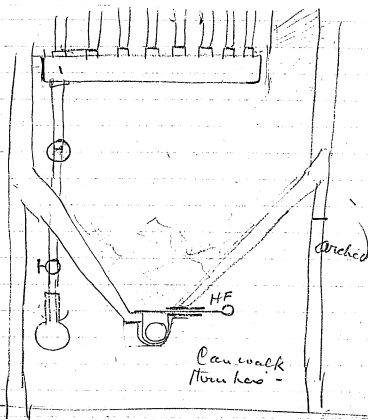


fig 4







arched

fig 7

Can walk
through -

1. For apparatus of the character described,
the combination with a current kiln of a ^{settling} dust chamber
through which the waste gases pass ~~on their way to~~
~~the stack~~ ^{through} which the waste gases pass
after leaving the kiln, a stack at the end of said
chamber distant from said kiln, and means
for conveying the dust deposited in said chamber
by the waste gases back to the kiln, substantially as described.

2. Series of chambers ^{dust settling} of ample proportion to
settle the dust carried by the hot gases from the kiln,
and means for automatically removing the dust
deposited in said chambers, substantially as described.

3. do. to and conveying the same back to the kiln
to be fed therein.

4. do. to settling chamber, a stack connected
thereto, means for cutting off said stack from
the waste gases, an auxiliary settling chamber,
a stack connected thereto, and means for cutting
off said stack from the waste gases, said
auxiliary chamber being connected to said
first named chamber, so that waste gases from
the kiln pass through the auxiliary chamber to the stack
thereof, when the stack of the first named chamber is
closed, substantially as described.

5. do. to and means for automatically removing the
dust deposited in said chamber,

- 2.
- 6 In app, etc, the combn with a kiln, of a series of settling chambers of proportions ample to settle the dust carried by the waste gases from the kiln, and a series of screw conveyors for removing the dust deposited in said chambers, substs as also
- 7 do, and elevating means for conveying the dust from said conveyors to the kiln to be fed therin,
- 8 do, settling chamber and an auxiliary settling chamber, and a hot air pipe connecting the two, and means for automatically removing the dust deposited in said chambers and pipe, substs as also,
- 9 and steam generating appliances located in said auxiliary settling chamber,
- 10 settling chamber, means for automatically removing the dust deposited therein by the hot waste gases from the kiln, and steam generating appliances located in said chamber,
- 11 do, consisting of a plurality of pipes hanging vertically in the chamber, and a drum connected therewith, said pipes being fixed only at one point ~~end~~ so as to be free to expand and contract,
- 12 do, consisting of gangs of pipes hanging vertically in the chamber, each gang a steam drum to which each gang is connected, and a blow off connection at the bottom,
- 13 do, said gangs of pipes being so hung as to be free to expand and contract,
- 14 In app, etc the combn with a kiln, of a pair of settling chambers connected together and to the kiln, a device in the chamber for

the more distant from the Kilm for ab-³-
stracting heat from the waste hot gases to do
useful work, a stack for each chamber and a
device for opening and closing connection
between each stack and its chamber, substa-
as descr.

- 15 do to, the stack of the more distant chamber
being so proportioned as to furnish a draft approxi-
mately equal to that furnished by the other stack
(when all the hot waste gases are passed there through),

when all the hot waste gases are passed
there through, substa as descr -

- 16 In app, etc the comb with a kiln, of
a settling chamber, connected with the kiln to
form a passageway for the waste gases issuing
from the kiln, and steam generator appliances
in said chamber arranged to evaporate a
~~constant quantity of water~~ at a constant rate
while the heat of the waste gases remains constant,
substa as descr.

- 17 In app, the comb with a kiln, of
a chamber connected with the kiln to form
a passageway for the waste gases issuing from
the kiln, and devices in said chamber for
abstracting heat from the waste gases passing
through said chamber, said devices constructed
and arranged to abstract heat from said gases
at a constant rate, substa - as descr -

- 18 do, and steam generator devices in said
chamber, a steam pipe connected therewith, and an
automatic valve in said steam pipe, arranged
to open when the steam in said pipe exceeds a given pressure,
substa - as descr -

19

of an approxi-
ately constant
volume and
temperature

The method of utilizing the waste ^{hot} gases from a kiln without ~~interfering~~ varying the draft of the kiln hereby, consisting in causing said gases to pass ~~through~~ ^{around} steam pipes and generate steam thereby at a definite rate, greater than the maximum rate of consumption of the engine or engines using said steam, to use as much of said steam in said engine or engines as desired, and to allow the remainder of the total amount of steam generated to escape, ~~substantially as does~~

20

the use of ^{one or both of} two settling chambers each provided with stacks and one provided with steam generative apparatus in the path of the waste hot gases, cutting off the stack of the chamber not provided with said apparatus when the latter is used, and cutting off the other stack and opening the former when it is desirable not to generate ^{pass the gases through} steam ~~into the~~ ^{from the} chamber provided with said apparatus, and generating steam at a constant rate when said gases are passed through said chamber, ~~substantially as does~~

21

causing ^{all of} said gases to pass ^{continuously} around steam pipes at a constant rate, greater than the rate of consumption of the means provided to utilize said steam, and in causing said gases to pass up a stack, designed to compensate ^{for the} constant loss of heat draft due to the abstraction of heat from the gases

- length steam pipes, and in deflecting said ^{5th} gases at will, so that they will not pass around said steam pipes and up said stack, but pass up another stack, of ~~the~~^a height ~~than~~^{sufficiently} the first mentioned stack, to compensate for the loss of draft in the said stack on account of the abstraction of heat from the gases about to pass up said stack by said pipes, ~~substitute~~^{as described}.
- 22 - In app of the class desc'd, the combin. with a kiln and a settling chamber, of a hot air pipe opening into said chamber, and means for automatically ^{removing} ~~substituting~~ any dust deposited in said pipe, ~~substitute~~^{as desc'd}.
- 23 - do two settling chambers, of a hot air pipe connecting said chambers, and
- 24 - the combin with a kiln of a settling chamber divided into two parts - lengthwise of the direction of passage of the gases ~~therein~~^{thereby}, 2, steam generative appliances in each division of the chamber, and conveying means for ^{removing} the dust deposited in each division of the chamber, ~~substitute~~^{as desc'd}.
- 25 - do to 1, and partition baffle plates in the path of the gases as they enter the divided chamber, to cause the gases to pass around the generative appliances, ~~substitute~~^{as desc'd}.
- 26 - In app the combin with a kiln of a settling chamber, and ~~steam~~^{steam} generative appliances in said chamber, said chamber divided into ^{sections} ~~sections~~, means for collecting dust in the bottom of each of said sections, and means for

unloading the dust from each of said⁶
sections, substa - as descr -

27

In app. to the comb in with a Kila, of a
chamber in the path of waste gases from
said Kila, steam generation apparatus in
said chamber, consist, of a plurality of units
of pipes, each unit consist, of a plurality of
vertically arranged pipes, connected together
and fixed at one point only, to be free to expand,
a steam drum, connected to the several units
and means for blowing off said units. substa
as descr -

28

a horizontal blow off pipe to which said
units are connected with a telescopic connection;
substa as descr -

April 12, 1915

File 740

Saw Mr. Edison re File 740

and he said the combination disclosed therein was the main thing and of importance and he thought he was entitled to broad claims on it. I asked him especially about the desirability of obtaining claims on the boiler per se and the dust removing feature per se and whether he wished divisional application filed thereon and he stated that he supposed other forms of boiler might be used, that the dust removing feature alone was not important, but that the combination was the important thing and to get all we could on it. He also said he didn't have time to give

the matter further consideration and for us to use our best judgment as to filing divisional application.

It would seem to me that it would be impossible for anyone to carry out the method of attaining the waste heat from below to generate steam, disclosed in this application, without infringing the broad apparatus claims, such as cl. 34, 5, 6

Folio No. 442

Serial No. 467/156

Applicant.

Thos. A. Edison

Address.

Orange, N. J.

Title Method of Treating Molds for Concrete

Filed December 12, 1908 Examiner's Room No. 308

Assignee

Ass't Exec. _____ Recorded _____ Liber _____ Page _____

Patent No. _____ Issued _____

ACTIONS.

*Dropped Jan 19, 1911
by authority of Mr. Dyer.
JFD*

- | | | |
|----|---------------------------------------|----|
| 1 | <u>Rejected Feb 7, 1909.</u> | 16 |
| 2 | <u>Reopened Feb 7, 1910.</u> | 17 |
| 3 | <u>Finally Rejected Feb 28, 1910.</u> | 18 |
| 4 | _____ | 19 |
| 5 | _____ | 20 |
| 6 | _____ | 21 |
| 7 | _____ | 22 |
| 8 | _____ | 23 |
| 9 | _____ | 24 |
| 10 | _____ | 25 |
| 11 | _____ | 26 |
| 12 | _____ | 27 |
| 13 | _____ | 28 |
| 14 | _____ | 29 |
| 15 | _____ | 30 |

FRANK L. DYER,
Counsel,
ORANGE, NEW JERSEY.

Received
Nov 25/08
J. L. Hunt

J. H. Hunt
Rochester, N. Y.
11/24/08

The object of this invention is to mould artistic relief work in ordinary Concrete, especially for residences and with a surface & outlines as sharp & perfect as in the original.

The invention consists in obtaining an iron casting from the original by methods ordinarily employed in the iron foundry - ~~then~~ removing sand etc & coating the surface with a paint of great viscosity ~~then~~ & of such a thickness as to eradicate any undercuts in the surface.

When a piece of Cast iron is cleaned & even polished

2

The surface when Examined under a Microscope shows numerous cavities many of which penetrate the surface obliquely & even the marks left by the cleaning tools or sand glass leave furrows ~~on~~ the sides of which are not perpendicular or but oblique to the surface. When the Concrete is poured against such a surface the Cast Collard runs into the holes & furrows & after setting locks the Concrete to the mould & upon the removal of the mould the perfection of the surface is marred by the damaged portions being mechanically locked to the face of the mould. Fig 1 illustrates microscopically a Cast iron surface ^{Even after} polishing which with artistic relief work is in many cases

3

impossible to economically
clean by tools -

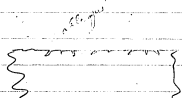
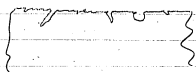


Fig 2 shows even greater enlargement
for the purposes of explanation

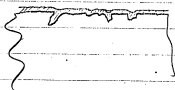


If you use a very viscous paint such
as ~~white~~ white lead paint sometimes
called Enamel is coated over
the surface or preferably
Japan Varnish is coated over
& baked all of these undercuts

4

of oblique crevices are filled
& there is nothing left on the
surface which is oblique &
which the Colloidal portion of
the Cement can penetrate &
oblique the surface to the
normal - all depression are perpendicular

Fig 13 shows



Hence the mould leaves the concrete
surface free of Cement & as the Japan
Varnish itself produces a very
smooth polished surface
impossible to get with Cast

5

now two objects are attained
the prevention of chipping &
improving the surface beyond
what it would be were
the non-perfect.

If heavy body lead paint or
enamel paint is used. It is

more liable to be injured in
handling the moulds hence

it is preferable to have
these surfaces japanned

in the ordinary manner by
baking. Japan surfaces are very

flexible even when new & will
stand peening with a hammer

without injury

6

I think I am the 1st to

make ornamental relief
work in iron moulds &

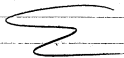
coating the same with a
flexible varnish of such a

viscosity that all under
cuts will be closed &

no adhesion between the
concrete & surface is
possible

also use of Cast iron
moulds japanned

also Viscous Enamelling
paint



Dec. 11, 1908

Hon. Commissioner of Patents,
Washington, D. C.

S i r :

Enclosed please find check for \$15.00, filing fee, together
with specification and one sheet of drawings in the application of
Thomas A. Edison entitled METHOD OF TREATING MOLDS FOR CONCRETE.

Kindly acknowledge receipt and oblige

Yours very truly,

General Counsel.

JMC/JS

Enc.

Petition.

To the Commissioner of Patents:

Your Petitioner

a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, West Orange, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

METHOD OF TREATING MOLDS FOR CONCRETE

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration No. 560), of Orange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thos. A. Edison

S P E C I F I C A T I O N

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, West Orange, County of Essex and State of New Jersey, have invented a certain new and useful improvement in METHOD OF TREATING MOLDS FOR CONCRETE, of which the following is a description:

This invention relates to methods of molding delicate objects and especially to molding artistic relief work in concrete. The object of the invention is to produce a method by which artistic relief work in ordinary concrete may be easily molded with the surface and outlines as sharp and perfect as in the original, and furthermore, to produce a mold by which such a process may be carried out. It will be understood that my invention may be useful in connection with the molding of other materials than concrete and for molding other objects than relief work, but I have conceived the invention with special reference to such work, and especially for the molding of artistic relief work in concrete for residences.

Reference is hereby made to the accompanying drawing, forming part of this specification, in which -

Figure 1 illustrates a cast iron surface as it would appear under the microscope, defects being exaggerated for purposes of explanation, and

Figure 2 shows a similar surface which has been treated as is contemplated in my invention.

The invention consists in obtaining an iron casting from the original by methods ordinarily employed in iron

foundries, removing the sand and other dirt therefrom, and then coating the surfaces of the iron casting against which the concrete is later to be poured, with a paint or varnish of great viscosity, and of such a thickness as to completely fill any undercuts in the surface of the casting.

When a piece of cast iron is cleaned and even polished, the surface, when examined under a microscope, shows numerous cavities, many of which penetrate the surface of the iron obliquely, as indicated at 1 in Figure 1, and even marks left by the tools of the workmen leave furrows in the casting, the sides of which are in many instances oblique to the surface. When concrete is poured against such a surface, the cement colloid runs into the holes and furrows, and after settling, locks the concrete to the mold, and upon the removal of the mold, the perfection of the surface of the concrete is marred because of the clinched portions of the concrete being mechanically locked to the face of the mold.

As contemplated by my invention, a very viscous paint such as white lead paint, sometimes called enamel paint, or other viscous paint or varnish, may be coated over the surface, or preferably, Japan varnish is coated over the surface and baked. After this treatment, all the undercuts are filled with the coating so that there are no oblique channels which the colloidal portion of the cement can penetrate. Whatever slight depressions may be left in the surface of the paint or varnish are perpendicular to the surface. Reference character 2 indicates such a depression in the coating of paint or varnish 3 in Figure 2 of the drawings.

By this treatment, two objects are attained, namely, clinching of the concrete or other molten material to the mold is prevented, and secondly, the surface of the finished

concrete or casting is improved, since the Japan varnish or paint itself produces a very smooth polished surface on the iron mould, impossible to obtain from the iron casting alone.

If heavy body lead paint or enamel paint is used, there is a greater liability of injury from handling to the molds than if the molds are varnished and japanned. Hence, it is preferable to have the surface japanned in the ordinary manner by baking. Japanned surfaces are very flexible, even when new, and will stand peining with a hammer without injury.

Having now described my invention, what I claim and desire to secure by Letters Patent of the United States is as follows:

1. The method of molding relief work in concrete consisting in obtaining an iron casting, cleaning the same, and coating the same with a flexible varnish of such a viscosity that all undercuts in the surface of the casting will be closed thereby, and pouring concrete against the coated surfaces of the casting as a mold, substantially as described.

2. The method of preparing a cast iron mold consisting in applying a coating of a drying material of such a viscosity that all undercuts in the surfaces of the mold will be closed thereby, substantially as described.

3. The method of preparing a cast iron mold, consisting in applying a coating of a drying material of such a viscosity that all undercuts in the surfaces of the mold will be closed thereby, and baking the same, substantially as described.

4. A mold for artistic relief work in concrete consisting of an iron casting having the surfaces against which the concrete is to be poured, coated with a material of such viscosity that all undercuts in the mold are closed thereby, and japanned, substantially as described.

This specification signed and witnessed this 9th day of December 1908.

Thomas A. Edison

Witnesses:

1. Anna R. Klehm
2. Dyer Smith

Oath.

State of New Jersey }
County of Essex } ss.

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Ilwellyn Park, West Orange, Essex County, New Jersey

that he verily believes himself to be the original, first and sole inventor of the improvements in

METHOD OF TREATING MOLDS FOR CONCRETE

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Thomas A. Edison
Sworn to and subscribed before me this 9th day of December 1908.

Anna R. Klehm
Notary Public.

(Seal)

442

Fig. 1

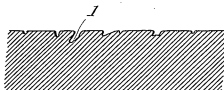
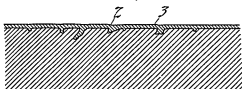


Fig. 2



Witnesses:

*Frank D. Lewis
Dyer Smith*

Inventor:

*Thomas A. Edison
by Frank L. Perry*

Atty.

442

Div. 15, Room 308
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

2-200.

AS

Paper No. 1

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

Thomas A. Edison,

WASHINGTON, D. C.

Feb. 9, 1909.

c/o Frank L. Dyer,

Orange, New Jersey.

Please find below a communication from the EXAMINER in charge of your application,
for METHOD OF TREATING MOLDS FOR CONCRETE, filed Dec. 12, 1908,
#467,156.

E. B. Moore.

Commissioner of Patents.

This case has been examined.

The claims are rejected upon

Bartlett, #848,955, Apr. 2, 1907 (25 - 121).

Slavis

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)	
METHOD OF TREATING MOLDS)	
FOR CONCRETE	)	Room No. 308
Filed December 12, 1908)	
Serial No. 467,156)	

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of February 9, 1909, reconsideration and allowance of the claims in this application as they now stand are respectfully requested. The reference merely describes the formation of a mold of sheet metal, which is veneered or enamelled to give it a glossy appearance. The patentee did not contemplate the use of a cast iron mold or mold of other cast metal, and consequently did not have applicant's problem to face. The claims of this application are limited to a method of treating a cast iron mold and to a mold of cast iron so treated as an article of manufacture. Applicant prepares a cast iron mold in the manner described to prevent the concrete of which the article to be molded is composed from flowing into undercuts or obliquely directed crevices in the surface of the cast iron mold and thus locking the concrete to the mold. Applicant's invention renders possible the molding of

intricate relief work in a cast iron mold. It cannot be said that it would not involve invention in view of the reference to enamel the face of a cast iron mold, because the reference merely discloses the idea of enameling the face of a sheet metal mold, and sheet metal, from the nature of its manufacture, does not present undercuts or oblique crevices in its surface. Hence, the patent cited does not convey the necessary information to a person who might wish to mold intricate relief work in a cast iron mold. Since applicant has met a new problem in a manner not suggested by the reference, it is thought that the claims contain patentable novelty.

Respectfully submitted.

THOMAS A. EDISON

By

Frank R. Dyer

His Attorney

Orange, N. J.

February 7, 1910.

442

Div...16...Room...303
ADDRESSES ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

2-200.

AB

Paper No. 3
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

Thomas A. Edison,

WASHINGTON, D. C.,

Feb. 28, 1910.

c/o Frank L. Dyer,

Orange, N. J.

Please find below a communication from the EXAMINER in-charge of your application,

for METHOD OF TREATING MOLDS FOR CONCRETE, filed Dec. 12, 1908,
#467,166.

E. B. Moore

Commissioner of Patents.

Responsive to letter filed Feb. 9, 1910.

In the reference, cited, steel is coated to make it smooth.
That is considered a sufficient reference for coating cast iron
with the same material and for the same purpose.

The claims are finally rejected upon the reference of record.

*Confidential
Smith*

January 18, 1911.

Mr. Dyer:

I hand you herewith file of Mr. Edison's patent application, Serial No. 467,156, for Method of Treating Moulds for Concrete.

All of the claims in the case, four in number, were finally rejected February 28, 1910 on the patent to Bartlett, No. 848,955.

The application relates to a method of rendering the surface of cast iron moulds smooth, so that artistic relief work in concrete may be moulded with a smooth surface and with sharp and perfect outlines. The surface of an ordinary iron casting is rough and has in it numerous cavities, some of which penetrate the surface obliquely. The under-cut cavities are particularly objectionable because the concrete after setting is locked by them to the mould, and the surface of the moulded article is apt to be marred when the article is removed from the mould. Mr. Edison proposes to overcome this difficulty in the following manner:

"A viscous paint such as white lead paint, sometimes called enamel paint, or other viscous paint or varnish, may be coated over the surface, or preferably japan~~ese~~ varnish is coated over the surface and baked."

Jan. 18, 1911.

The patent to Bartlett shows a mould for making bricks or other rectangular bodies from concrete having one or more smooth or glossy faces. The mould is formed in part of sheet metal rendered smooth or glossy in any suitable way, as, for example, the faces of the sheet metal may be coated with japan or other material adapted to be cured by baking, or they may be provided with a coating of fusible enamel.

Mr. Holden, Mr. Smith and myself are of the opinion that the claims are met by the patent, because the patent discloses a method of treating a metal mould that is the same as that proposed by Mr. Edison and is for the same purpose.

Will you kindly advise us whether we shall take an appeal or drop the case?

HL/KGK

Henry Lawson

REFER TO THIS NUMBER
IN YOUR REPLY

1057

MEMORANDUM

FRANK L. DYER,
ORANGE, N. J.

Mr. Lanahan:

1/19/11.

Replying to your memorandum of the 18th inst., I agree with you that it would be hopeless to appeal the Edison Application Serial No. 467,156. The Edison invention relates to the application of a smooth coating to a cast metal mold, while the Bartlett patent relates to the application of such a coating to a sheet metal mold. With sheet metal the material is rolled under heavy pressure, and I imagine is free from the cavities which characterize the casting. If this is so, Bartlett's idea is merely to give polish to the surface of the molded articles, while Edison's idea is to prevent the molded

Mr. Lanahan- 2.

articles from having their surfaces marred by the cavities of the mold. The distinction, however, is so fine that I do not believe you could ever succeed in convincing the Patent Office as to its patentability.

FLD/IWW

Enc-

F. L. Dyer

11
Thos. A. Edison

Method of Treating Moulds for Concrete.

1. The method of moulding relief work in concrete consisting in obtaining an iron casting, cleaning the same, and coating the same with a flexible varnish of such a viscosity that all undercuts in the surface of the casting will be closed thereby, and pouring concrete against the coated surface of the casting as a mould, substante as described -
2. The method of preparing a cast iron mould ~~for relief work in concrete~~ consisting in applying a coating of a drying material of such a viscosity that all undercuts in the surface of the mould will be closed thereby, substante as described.
3. do, and baking the same,
4. A mould for artistic relief work in concrete consisting of an iron casting having the surface against which the concrete is to be poured, coated with a material of such viscosity that all undercuts in the mould are closed thereby, and japanned, substante as described.

Folio No. 447

Serial No. 469,885

Applicant.

Thos. A. Edison

Address.

Orange N.J.

Title Molding for Concrete Construction.

Filed December 29, 1908.

Examiner's Room No. 308.

Assignee Issued in Mr. Edison's name

Thomas A. Edison, Inc.
Ass't g't Exec. June 30, 1912 Recorded July 7, 1916 Liber 5127 Page 52

Patent No. 1,123,261 Issued January 5-1915

ACTIONS.

- | | | | |
|----|---------------|----------------|----|
| 1 | Rejected | Mar. 9, 1909 | 16 |
| 2 | Amended | Mar. 7, 1910 | 17 |
| 3 | Rejected | Mar. 28, 1910 | 18 |
| 4 | Amended | March 15, 1911 | 19 |
| 5 | Rejected | April 11, 1911 | 20 |
| 6 | Amended | Mar. 28, 1912 | 21 |
| 7 | Rejected | May 22, 1912 | 22 |
| 8 | Amended | May 14, 1912 | 23 |
| 9 | Rejected | July 14, 1913 | 24 |
| 10 | Amended | July 10, 1914 | 25 |
| 11 | Rejected | Aug. 7, 1914 | 26 |
| 12 | Amended | Oct. 27, 1914 | 27 |
| 13 | Allowed | Nov. 11, 1914 | 28 |
| 14 | Final fee due | May 11, 1915 | 29 |
| 15 | | | 30 |

FRANK L. DYER,
Counsel,
ORANGE, NEW JERSEY.

Redwood
Nov 25/08
G. L. Howe
L. E. Sawyer
Reddy Saw
11/24/08

Another point

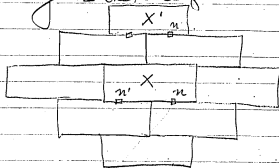
~~I~~

10 ft of cement is
to construct moulds for a
complete dwelling - made of
battered Cast iron sections
Wherein those sections which
serve to give artistic relief
~~and~~ work are provided with
keys or guides so that they can
be removed when the cement
is weak & without injury due
to the removal of the moulds

The slightest side motion given
the mould on removal will
break off the high relief parts

2

hence they should be moved outwardly
without any lateral movement as
2 or 3 $\frac{1}{1000}$ of an inch will
injure the relief -



X' is a section against the green
cement, any attempt to remove this
heavy Cast iron piece ~~will~~
outwardly away from the concrete
surface ~~will~~ without some
guide will certainly break off
the high reliefs. I obviate this

3

by using Keys n n n
which act as guides to prevent
side movement & this ensures
that no side strains shall
come on the green cement

~~12~~

This is now -

763

Folio No. 454

Serial No. 476, 488

Applicant.

Thos. A. Edison

Address.

Orange, N. J.

Title

Crushing and Separating Fine Materials

Filed

February 6, 1909.

Examiner's Room No.

315

Assignee

Thomas A. Edison Inc.

Ass't Exec.

June 30, 1910

Recorded

July 7, 1910

Liber

3127

Page

50

Patent No. 100,250

Issued

Sept. 5, 1911

Reissue - 13382

Mar. 12, 1912

ACTIONS.

- | | | |
|----|---|----|
| 1 | <u>Rejection February 27, 1909</u> | 16 |
| 2 | <u>Amended Feb. 18, 1910</u> | 17 |
| 3 | <u>Rejection March 1, 1910</u> | 18 |
| 4 | <u>Amended Feb. 25, 1910</u> | 19 |
| 5 | <u>Allowed March 26, 1911</u> | 20 |
| 6 | <u>Petition for renewal Jan. 27, 1912</u> | 21 |
| 7 | | 22 |
| 8 | | 23 |
| 9 | | 24 |
| 10 | | 25 |
| 11 | | 26 |
| 12 | | 27 |
| 13 | | 28 |
| 14 | | 29 |
| 15 | | 30 |

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

The object of this invention is to increase the capacity of that class of ~~crushing~~ appliances connected with crushing machinery which consists of a conveying system & a blowing system whereby the fine material & dust such as Portland Cement can be removed from the body of ore & the coarse ore returned to the Crusher.

In the case of Ralls as described in my Pat. 541677. The product from several ralls all pass to ~~one~~ ^{one} common belt conveyor system, thence down through a number of blowers connected with dust chambers for settling the dust blown out, the blown ore falling upon ~~the~~ ^{one} common ~~belt~~ conveyor system to be returned to the several crushing ralls —

Where the material is very hard the percent of fines is small for the amount of material handled, & it is very desirable to relieve the conveyor system of so large a bulk & to increase the capacity of the blowers.

2

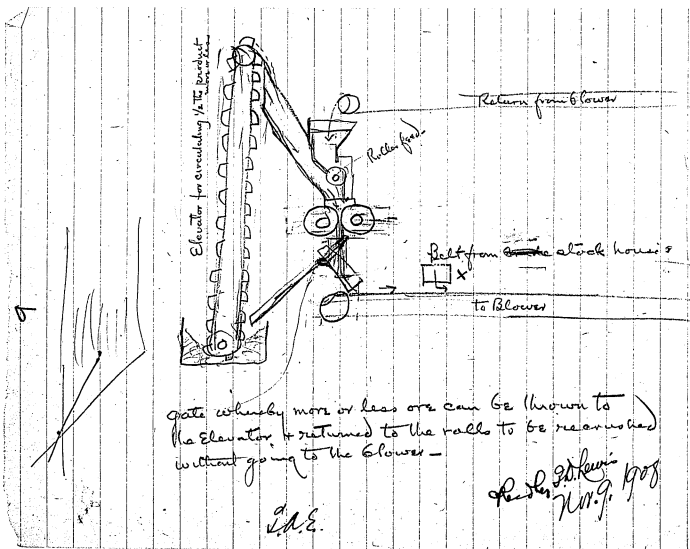
I attain this result in a very simple manner by connecting ^{to each roll} an elevator ~~whereby~~ ^{by just a} an deflecting plate whereby any portion of the ore after passing through the roll & which would go to the blowers is returned to the roll locally & enriched thus enriching the ore which does ~~go there~~ ^{go to the blowers} for illustration if the ore passing through the rolls was 300 tons per hour with 10% of fine material of the required size, if 300 tons would have to be handled by the Conveying system & blowers to obtain 30 tons theoretically -

If now 150 tons was removed by the deflecting plate & thrown to the Elevator & then thru the roll, the roll would still make 30 tons per hour ~~whereas~~ the 150 tons going to the blowers would be enriched ~~thru~~ ^{thru} the And two rolls could be used crushing at rate of 600 tons per hour with only 300 ^{tons} going over the Conveying system & blowers but with twice the quantity of desirable material - hence with

a Conveying system limited to handling
& blowing 600 tons per hour & 2 rolls
we can by this device use 4 rolls -
thus doubling the Capacity of the
Conveying & Blowing system -

It is now to Crush, convey, blow, & return
for re-crushing - adding crude ore to
the same extent as the dust is removed
this covered by my pat. —

It is further new to Crush, divide the result
part returned to the Crushers & the other to be
blown which a greater output is
obtained from the blowers without
increasing the power for conveying



Crushing and Separating Fine Materials.

for separating said crushing material apparatus,
In effect the character describes in an
^{means}
division means for conveying material from
separating the crushed material, means for separat-
ing ^{means,} sufficiently fine particles from the tailings, means
for conveying one division of the crushed ^{material} ^{character}
to the ^{separating} means, means for conveying the
tailings from the separating means back to the
^{used in the} crushing means, and means for conveying the
other division of the crushed ^{material} ^{character} back to the
feed for the crushing means subst. as descr.

2 do, in combin, crushing means feeding means for the same of means for dividing the crushed material as it leaves the crushing means of means for returning one division of the crushed material immediately to the feed for the crushing means, and means for conveying the other division of the crushed material to a separator, and said separator, select as does 3 do to, and means for returning one division of the crushed mat's immediately to the feed for the crushing means, select as does.

3 do to, and means for returning one division of the crushed mat's immediately to the feed for the crushing means, subject as disc.

4 do as 3, but insert adjustable

5 - in combin crushing rolls, a hopper for the same, a
means for deflecting separating the crushed material
into two parts, a continuously operating elevator for
conveying one of said parts back to the hopper, and continuously
operating means for conveying the other part to a separator,
said separator, and means for returning the tailings of
said separator to said hopper, substantially as described.

6. do, but insert "adjustable"

7. do as 5, but insert after "separator" ^{including} ~~means for~~ ^{separating} ~~and conveying away from particles~~ ^{the finer} particles, means for conveying away said finer particles,

8

Means for conveying uncrushed material to do as 5 to ^{the} part to a blower, said blower ~~for~~ for separating the finer particles from the residue, dust chambers for settling the particles so separated, and means for returning the residue from said blower to said hopper, subst. as descr.

Fig. 79

109

The process of crushing and separating ^{performing separating operations} fine material, consisting in continuously ^{performing separating operations} crushing material, dividing the crushed material into two parts, returning one of said parts for re-crushing, separating fine particles from the other part, returning the residue ^{with sufficient amount} for re-crushing, and adding uncrushed material to replace the fine particles removed, subst. as descr.

11 to

Consisting in maintaining material in circulation ^{in a closed system} through crushing and separating means, ~~means~~ ^{means} removing the fine particles separated and adding crude material to the circulation system sufficient to replace the material removed, and ~~shunting some~~ ^{shunting some} of the material crushed again through the crushing means, ~~means~~ ^{means} a second closed system including the crushing means but excluding

11 ~~to~~

means in one of two closed systems, both including ^{the same} crushing means, and only one including separating means, removing the fine M particles in one system and adding crude material sufficient to replace the material removed, the material passing through the ^{second} system ultimately passing into the first named system, substantially as described.

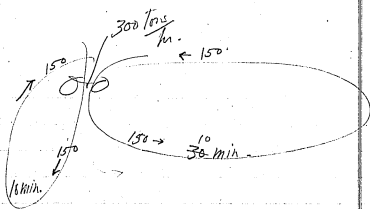
12 #

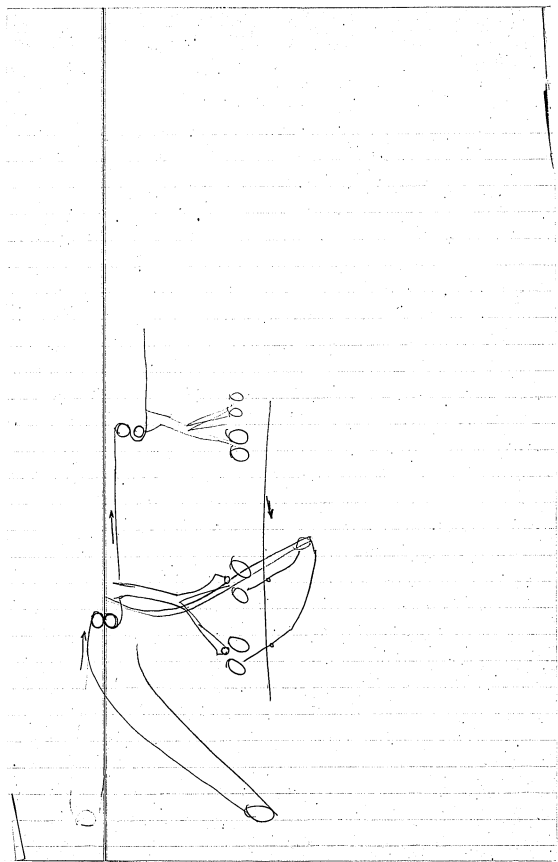
The material dividing between the two systems ~~is~~ in a certain ratio and

9

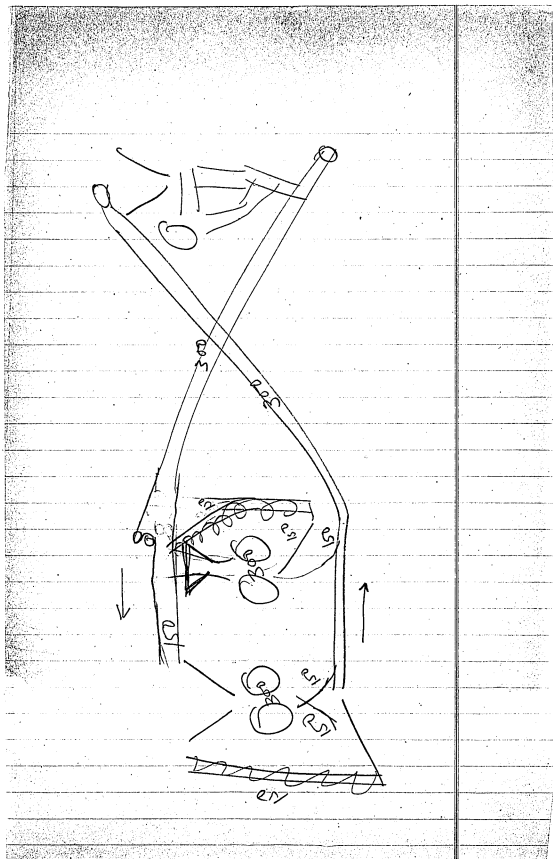
In app sep and crushing app, in common a plurality of crushing means, feeding means for the same, means for dividing the crushed material as it leaves the various crushing means, means for returning one division of the material crushed by each crushing means immediately to the feed for the second crushing means, means for conveying the other divisions of the crushed material to a separator, said separator, and means for returning the tailing of said separator to the various feeding means, substantially as described.

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[ON BACK OF PRECEDING PAGE]



$$(1) \frac{x}{2} - \frac{x}{2} = 0$$

$$\frac{x}{2} + \frac{10}{2} = \frac{x}{2} + \frac{10}{2}$$

$$\frac{x}{2} + \frac{10}{2} = \frac{x}{2} + \frac{10}{2}$$

$$\frac{x}{2} + \frac{10}{2} = \frac{x}{2} + \frac{10}{2}$$

$$1F + \frac{10}{2} = \frac{10}{2}$$

$$\frac{x}{2} + \left(\frac{x}{2} + \frac{10}{2} \right) = \frac{x}{2} + \left(\frac{x}{2} + \frac{10}{2} \right)$$

15, 21.75, 24.75, 26.14, 26.76, 27.04, 27.18

$$\frac{x}{2} + \frac{10}{2} = \frac{x}{2} + \frac{10}{2}$$

24

$$\frac{x}{2} + \frac{10}{2} = \frac{x}{2} + \frac{10}{2}$$

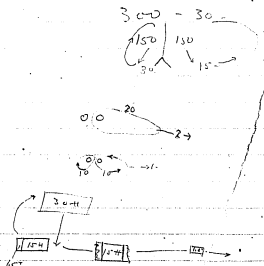
$$\frac{x}{2} + \frac{10}{2} = \frac{x}{2} + \frac{10}{2}$$

$$\frac{x}{2} + \frac{10}{2} = \frac{x}{2} + \frac{10}{2}$$

$$\frac{x}{2} + \frac{10}{2} = \frac{x}{2} + \frac{10}{2}$$

[ON BACK OF PRECEDING PAGE]

Thos
met
3

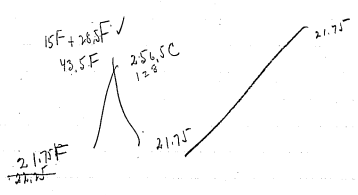


300
270
30

21.3
21.5

15F 28.5°C
↓
○ ○

2



21.75 F \rightarrow 78.25 C
○ ○

21.75 F + 27.84

49.57 F

↑

24.78 F

24.75

24.78

³ 24.78 F 275.28 C

0/0

24.78
27.52
52.30

26.15

$$\begin{array}{r}
 3 \\
 26.15 \\
 27.39 \\
 \hline
 2 \overline{) 53.54} \\
 26.78
 \end{array}$$

273.86

$$\begin{array}{r}
 3 \\
 26.76 \\
 27.3.24 \\
 26.76. \\
 \hline
 2 \overline{) 54.084} \\
 27.042
 \end{array}$$

$$\begin{array}{r}
 3 \\
 27.04 \\
 27.296 \\
 27.04 \\
 \hline
 2 \overline{) 54.34} \\
 27.17
 \end{array}$$

$$\frac{A}{20}, \frac{29A}{400}, \frac{66.1A}{800},$$

A

x y

$$\frac{x}{2} + \frac{300-x}{10}$$

2

$$\frac{15}{9} \quad \frac{135}{300}$$

$$2) \frac{435}{81}$$

$$\frac{10x + 300 - x}{20}$$

$$\frac{9x + 300}{20} = \frac{9x}{20} + 15$$

300

$$\frac{15}{2} \cdot \frac{300-15}{19}$$

$$15 \cdot \frac{135}{20} = \frac{6.75}{11} = 21.75$$

15

$$21.75 \checkmark$$

$$26.81 \checkmark$$

$$27.06 \checkmark$$

$$27.18 \checkmark$$

$$27.23 \checkmark$$

$$27.29 \checkmark$$

[ON BACK OF PRECEDING PAGE]

$$\begin{array}{r} 27.8 \\ 1.4 \\ \hline 12.9 \\ 15.6 \\ \hline 27.5 \end{array}$$

$$\begin{array}{r} 20 \overline{) 27.5} \checkmark \\ \underline{1.875} \checkmark \\ 12.375 \\ \underline{15.6} \\ 27.375 \end{array}$$

$$\begin{array}{r} 27.4 \\ 1.37 \\ \hline 9 \\ \hline 12.33 \\ 15 \\ \hline 27.33 \end{array}$$

$$\sqrt{27.33}$$

$$\begin{array}{r} 15.96 \overline{) 27.33} \\ \underline{13.1} \\ 14.23 \\ \underline{11.09} \\ 27.14 \end{array}$$

$$27.3$$

$$\begin{array}{r} 14.65 \\ 9 \\ \hline 12.985 \\ 15 \\ \hline 28.27 + 28 \end{array}$$

Folio No. 456

Serial No. 479,587

Applicant.

Address.

Thos. A. Edison

Title *Improvements in Phonographs*

Filed *February 23, 1909.* Examiner's Room No. *379.*

Assignee

Ass'g't Exec. Recorded Liber Page

Patent No. Issued

ACTIONS.

- | | | |
|----|---------------------------------|----|
| 1 | <i>Rejected Mar. 19, 1909.</i> | 16 |
| 2 | <i>Amended Mar. 17, 1910.</i> | 17 |
| 3 | <i>Rejection Apr. 2, 1910.</i> | 18 |
| 4 | <i>Amended March 15, 1911.</i> | 19 |
| 5 | <i>Rejected April 15, 1911.</i> | 20 |
| 6 | <i>Amended Mar. 26, 1912.</i> | 21 |
| 7 | | 22 |
| 8 | | 23 |
| 9 | | 24 |
| 10 | | 25 |
| 11 | | 26 |
| 12 | | 27 |
| 13 | | 28 |
| 14 | | 29 |
| 15 | | 30 |
- Drapped as per instructions written above by Mr. Edison March 16 - 1913*
- FILED*

FRANK L. DYER,
Counsel,

ORANGE, NEW JERSEY.

Feb. 20, 1909

Hon. Commissioner of Patents,
Washington, D. C.

S i r :

Enclosed please find check for \$30.00, filing fees,
together with specifications and two sheets of drawings in the appli-
cations of Thomas A. Edison, IMPROVEMENTS IN PHONOGRAPHS and SOUND
RECORDS. *folio 456*

Kindly acknowledge receipt and oblige

Yours respectfully,

General Counsel.

JMC/JS

Enc.

Petition.

To the Commissioner of Patents:

Our Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, West Orange, County of Essex, State of New Jersey

prays that letters patent may be granted to him for the improvements in

IMPROVEMENTS IN PHONOGRAPHS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration No. 560), of Orange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thos. A. Edison

- SPECIFICATION -

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, Orange, in the County of Essex and State of New Jersey, have made a certain new and useful improvement in PHONOGRAPHS, of which the following is a description:

My invention relates to various improvements in phonograph recorders and reproducers, my object being to provide a phonograph recorder adapted to form a sound record such as is fully disclosed and claimed in my application filed on even date herewith and in which the record groove is of approximately V-shaped cross-section and so relatively condensed that a much more extended reproduction may be secured from a cylinder of standard dimensions than is now possible, and also to provide a phonograph reproducer adapted to efficiently track the same.

As phonograph records have been chiefly made in commercial practice heretofore, a circular edged recorder having a diameter of about .040 inch is engaged with a rotating blank, so as to track very slightly below the surface, the surface speed of the blank being upwards of 90 feet per minute, and the recording spaces being only 1/100 of an inch in width. This produces the standard record having 100 threads per inch. In my previous application Serial No. 350,646, filed January 3, 1907, I describe a sound record made with a circular edged

recorder having a diameter of about one quarter that of the recorder which, as previously described, is used to make the 100 thread records. In the application No. 350,646 above referred to, the record is made on a recording machine having a feed screw which preferably has a pitch of 200 threads to the inch. This cuts a record to a suitable depth in a space $1/200$ of an inch wide instead of $1/100$ of an inch, the improved record so made having, therefore, 200 threads to the inch. In the case of both the standard 100 thread record and the improved 200 thread record made with a recorder as just described, the deepest depressions which can be formed without overlapping upon the adjoining spaces are extremely shallow, being about $6/10,000$ of an inch in depth. In the case of the 100 thread record, the width of the record groove is about sixteen times the maximum depth, and its walls are of such slight curvature that difficulty is experienced in tracking the record, unless the reproducer stylus is mounted with great flexibility. In the case of the improved 200 thread record of application Serial No. 350,646, the ratio of width to depth above referred to is cut in half, becoming approximately 8 to 1.

In endeavoring to produce a record having substantially more than 200 threads per inch, for example, 400 threads per inch with a circular edged recording stylus, various difficulties present themselves one of which is the production of a cutter of sufficiently small size to cut such a narrow groove to a desirable depth, and furthermore such a groove even when produced does not make a practical record because the side walls are too thin or narrow to have the requisite strength needed in molding and reproducing.

According to the present invention I use a cutting stylus having straight inclined side edges, preferably slightly rounded at the bottom or point. I am aware that V-shaped cutters have been used heretofore for the production of record grooves, but the angle between the cutting edges, so far as I am aware, has not been such as to produce a desirable record groove. I have determined the proper angle to be used in order to produce the best results, particularly in a groove having 400 threads to the inch, which angle should be approximately $9\frac{1}{2}$ degrees between the two cutting edges of the recorder, and the same between the sides of the record groove or $46\frac{1}{2}$ degrees between one of the cutting edges and the median line of the cutter, and the same between one of the sides of the groove and a plane drawn perpendicular to the record surface parallel to the groove. When this angle is used, the point of the stylus is rounded on a curve whose diameter is .001 inch which is a suitable curve for records of such pitch.

This angle may be varied slightly under differing conditions while securing the advantages of the invention, as for instance, when the diameter of curvature of the point of the stylus is changed, but I recommend the angle and curvature above mentioned as being those best suited for 400 thread records.

In a groove produced by such a stylus and having 400 threads per inch, the ratio between the width of the groove and its maximum depth is approximately 2.5 to 1. Such a record groove has clearly defined side walls of sufficient strength to enable it when molded to be removed from the mold without injury to the side walls and to en-

able it to be tracked by a reproducer stylus.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming part of this specification and in which -

Figure 1 is a front elevation, greatly enlarged, of my improved recording stylus in the act of cutting a record;

Figure 2 is a side elevation of the same;

Figures 3 and 4 are respectively a side elevation and bottom plan view of the recording stylus mounted on a diaphragm;

Figure 5 is a side elevation, greatly enlarged, of a portion of my improved reproducer stylus engaging the record groove;

Figure 6 is an end view of the same;

Figure 7 is a side elevation of the complete reproducer, and

Figure 8 is a bottom plan view showing the stylus, stylus lever and portion of the floating weight.

Referring to Figures 1 and 2, the recording stylus 1, which may be of sapphire or other suitable material, is a cylinder whose axis is normal to the record surface and whose lower end is formed as a cone 2, the apex of which is rounded on a spherical curve 3 whose diameter may be .001 inch.

The cutting edges 4 are formed by removing material from the cone 2 on a curve extending beyond or to the rear of the axis of said cone, as shown in Figure 2. The lines forming said edges are substantially straight lines and they are inclined toward each other at an angle

of approximately 93 degrees, that is, each cutting edge forms an angle of $46\text{-}1/2$ degrees with the axis of the recorder. Such a recorder will form the record groove of Figure 1, having side walls 2, which are inclined toward the vertical at an angle of approximately $46\text{-}1/2$ degrees, and the bottom of which is rounded on a circle whose diameter is .001 inch.

The stylus 1 may be mounted in a socket 6 formed integral with the holder 7 which is cemented to the diaphragm 8, the latter being mounted in any approved manner as is well known in this art.

A suitable reproducer stylus for tracking the record groove 2 is shown in Figure 5. It is of sapphire or other suitable material and comprises a shank 9, neck 10 and head 11, all circular in transverse section. The head 11 is formed with a bearing surface having conical walls 12 inclined toward each other at an angle of approximately 93 degrees, or an angle of $46\text{-}1/2$ degrees to the perpendicular, and rounded at the plane of intersection on a curve or circle whose diameter may be .001 inch.

This stylus is secured in a socket formed in one end of the stylus lever 13, the shank of the stylus extending transversely to the record groove. The stylus lever is pivoted at 14 to the lugs 15 depending from the floating weight 16 which is universally pivoted to the body 17 in the usual manner, the usual link 18 connecting the other end of the stylus lever with the diaphragm.

Having now described my invention, what I claim and desire to secure by Letters Patent is as follows:

of proper size and adapted to cut in record.
Screw having approximately 40 threads per inch
and

- Invent "A" Claim 2 & 3. Mar 18/10.

3. A phonograph recording stylus whose cutting substantially straight lines formed on a cone, the apex of said cone being removed beyond its axis, the stylus being used as described.

Cancelled 7/26/12 Incent B' - Claim 11

surface is V-shaped in a plane transverse to the record groove, and curved in a plane parallel to the record

Argue

Wiggle

to the record groove, substantially as described.

78. A phonograph reproducer stylus whose bearing surface is V-shaped with a rounded apex in a plane transverse to the record groove and circular in a plane parallel to the record groove, substantially as described.

89. A phonograph reproducer stylus whose bearing surface is V-shaped in a plane transverse to the record groove and curved in a plane parallel to the record groove, the extent of bearing surface of the stylus in the latter plane being materially greater ^{at all times} than in the former plane, substantially as described.

91a. A phonograph reproducer stylus whose bearing surface is V-shaped in a plane transverse to the record groove and circular in a plane parallel to the record groove, the extent of bearing surface of the stylus in the latter plane being materially greater ^{at all times} than in the former plane, substantially as described.

101. In a phonograph reproducer, a stylus lever, means for supporting the said lever parallel to the record groove, a stylus carried by said lever with the shank thereof extending transversely to the ^{plane of the} lever, the said stylus having a head curved in a plane parallel to the record groove and V-shaped in a plane transverse to the record groove, substantially as described.

127. In a phonograph reproducer, a stylus lever, means for supporting the said lever parallel to the record groove, a stylus carried by said lever with the shank thereof extending transversely to the ^{plane of the} lever, and parallel to the surface of the record, the said stylus having a head curved ^{on the arc of a circle} in a plane parallel to the record groove and V-shaped in a plane transverse to the record groove, substantially as described.

Swiss Patent 261,411

This specification signed and witnessed this 18th day of February 1909.

Thomas A. Edison

Witnesses:

1. Frank L. Dyer
2. Dyer Smith

Oath.

State of New Jersey } ss.
County of Essex }

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, West Orange, County of Essex, State of New Jersey

that he verily believes himself to be the original, first and sole inventor of the improvements in

IMPROVEMENTS IN PHONOGRAPHS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 18 day of February 1909.

Thomas A. Edison
Anna R. Edison
Notary Public.

(Seal)
[Seal]

NOTARY PUBLIC, STATE OF NEW JERSEY
COMMISSION EXPIRES, JUNE, 1910.

456

V

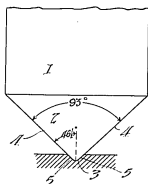


Fig. 1

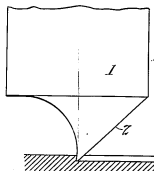


Fig. 2

Fig. 4

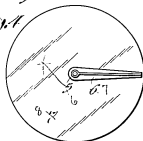


Fig. 7

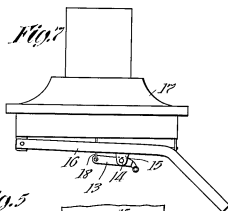


Fig. 3



Fig. 5

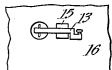
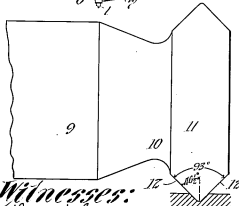
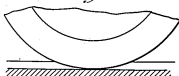


Fig. 8

Fig. 6



Witnesses:

*Frank D. Lewis
Dyer Smith*

Inventor:

*Thomas A. Edison
by Frank L. Smith
Atty.*

456

2-260.

Div. 23.....Room..379

All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

J.H.D.-Li.

Paper No. 2-554

All communications regarding this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

March 19, 1909.

Thomas A. Edison,
Care Frank L. Dyer,
Care Edison Laboratory,
Orange, New Jersey.

U. S. PATENT OFFICE,
MAR 19 1909
MAILED.

Please find below a communication from the EXAMINER in charge of your application,
for Phonographs, filed February 4 23, 1909, serial number 479,587.

E. B. Moore

Commissioner of Patents.

The examiner cannot see any patentable distinction
between applicant's claimed devices and the devices in Von Wouwer-
man's British patent #19,561 of 1897, (181-2), or Bell and Tainter
#341,214, May 4, 1886, (181-5) or Jones, June 28, 1904, #763,903, (181-
11); Johnson, January 3, 1905, #778,978 (181-11), and the claims are
rejected accordingly.

RECEIVED
MAR 20 1909
FRANK L. DYER.

Li

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison :
IMPROVEMENTS IN PHONOGRAPHS :
Filed February 23, 1909 : Room No. 379.
Serial No. 479,587 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of March 19th, 1909, please amend this case as follows:

✓ Claim 1, line 2, after "stylus" insert - of proper size and adapted to cut a record groove having approximately 400 threads per inch and - .

✓ Cancel Claims 2, 3 and 4 and insert the following as 2 and 3:

Cancelled 7/6/12 - Invent B -
~~2. As a new article of manufacture, a phonograph recording stylus having a conical lower end, a portion of the material of said cone being removed from the front of the stylus to form a forward face extending from the apex of the cone rearwardly of the axis thereof, to form cutting edges, substantially as described.~~

a
~~3. As a new article of manufacture, a phonograph recording stylus having a conical lower end, the sides of said cone being inclined toward the axis thereof at an~~

12
angle of approximately $46\frac{1}{2}$ degrees, the apex of said cone being slightly rounded in a plane transverse to the record groove, and the material of said cone being cut away from the front of said stylus to form ^{the cutting edges} a forward face extending from the apex of the cone axially or rearwardly of the axis of the cone for a short distance above the apex, substantially as described.

✓ Claim 5, line 3, after "groove" insert - the included angle between the sides of the V being approximately 93 degrees - .

✓ Claim 9, line 5, after "greater" insert - at all times - .

✓ Claim 10, line 5, after "greater" insert - at all times - .

✓ Claim 11, line 4, before "lever" insert - plane of the - .

✓ Claim 12, line 4, before "lever" insert - plane of the - . Line 6, after "curved" insert - on the arc of a circle - .

Renumber Claims 5 to 12 as 4 to 11 inclusive.

REMARKS

Reconsideration and allowance of the claims as amended are requested. None of the references shows a recording stylus having cutting edges which are straight lines inclined toward each other at the angle specified, or which are adapted to cut a record groove having approximately 400 threads per inch. The angle claimed was determined by a series of experiments and is apparently

necessary for the practical production of a record groove having 400 threads per inch. None of the references refers to the angle of inclination of the sides of the recorder and none of them discloses a construction such as shown in the drawings. It is obvious that none of them had conceived applicant's invention, since none of them had attempted to form a sound groove ^{on} anything like the microscopic scale contemplated by applicant's invention. Referring to new Claims 2 and 3, it may also be noted that none of the references discloses a recorder having conical cutting edges, the front faces of the stylus being formed by cutting away the material of the cone from the apex of the cone in a plane axial of the cone or extending rearwardly of the axis of the cone from the apex thereof, or curved in such a manner that it is tangent to the axis of the cone or crosses the same a slight distance above the apex. In the construction of Von Wouwermans, as shown in Figures 1 to 4 of his British patent, the cutting point is considerably to the rear of the axis of the cone, and hence, this point cannot be termed the apex of the cone. This patentee attempted to form a very peculiar type of record and in doing so proposed to form a sharp cutting edge at the lower extremity of his stylus and a scraping surface above the same. This necessitated a different structure from that claimed by applicant.

Referring to Claims 4 to 11 inclusive, none of the references discloses a phonograph reproducer stylus whose bearing surface is V-shaped in a plane transverse to the record and curved in a plane parallel to the

record groove. In Von Wouwermans' reproducer, the bearing surface is V-shaped in a plane parallel to the record and curved in a plane transverse thereto, just the opposite of applicant's construction. The construction of this patent could not possibly be used for an exceedingly fine record groove such as contemplated by applicant in which, because of the extreme narrowness of the groove, the sound waves are all much longer than they are wide. Neither could his stylus track applicant's groove, since the latter is triangular in cross section, whereas, the patentee's is elliptical. None of the other references cited discloses a structure at all similar to applicant's, the only reproducer stylus shown being the well known conical steel needle used in reproducing from disc records. It is also to be noted that in Claims 10 and 11 a stylus is claimed having a shank extending transversely to the plane of the stylus lever and having a head which is curved on the arc of a circle in a plane parallel to the record groove and V-shaped in a plane transverse to the record groove, which is an entirely novel structure and one which is apparently necessary for practical reproduction from a sound groove of the character specified. It should also be noted that in Von Wouwermans' reproducer construction, the bearing surface of the stylus in a plane parallel to the record groove cannot be materially greater than the bearing surface transverse to the record groove, and certainly not in the case of relatively long record grooves, since the maximum bearing surface in each instance is the diameter of the shank c of his stylus.

Respectfully submitted.

Orange, N. J.
March 17, 1910.

THOMAS A. EDISON

By Frank L. Dyer
Attorney.

Div. 25 Room 379

ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

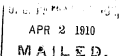
J. H. D.-S.

Paper No. 1863.

All communications respecting
application should give the serial number,
date of filing, and title of invention.DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

April 2, 1910.

Thomas A. Edison,
Care Frank J. Dyer,
Orange, New Jersey.

Please find below a communication from the EXAMINER in charge of your application.

for Phonographs, filed February 23, 1909, serial number 479,587.

E. B. Moore.

Commissioner of Patents.

Confidential
Smick

This action is responsive to the amendment filed March 19, 1910.

Page 1, line 10, the proper serial number should be inserted after "application".

Claim 1 is rejected upon Bruening, November 10, 1891, "462,687, (181-5). The angle between the sides of Bruening's recorder is apparently, from the disclosure in the drawings, approximately 90 to 93 degrees and such a modification as to make the angle exactly 93 degrees is held not to be within the scope of patentable subject matter. The limitation of producing 400 threads per inch, is held not to be a patentable limitation.

Claim 2 is rejected upon Bruening cited, in view of Edison, September 25, 1906, #831,606, (181-3), see especially Figures 9, 10 and 13, or Oulton's English patent, April 10, 1894, #7090, (181-10). It is held no invention to cut away a portion of Bruening's recorder, in view of Edison and Oulton cited.

Claim 3, as at present advised, is allowable.

Claims 4 to 9 inclusive are rejected upon Thoms, et al.,

Feb. 22, 1910, #949,991, (181-10);
Brown, July 17, 1900, #653,654, (181-5), or
Bettini, Aug. 13, 1889, #409,000, (181-10).

#479,587-----2.

In all of these, especially Thoma, Figures 4, 6 and 7, the section transverse to the record groove is V-shaped and parallel to the record groove, is circular .

Claims 10 and 11 are rejected upon the references last cited, in view of Weber, #981,496, March 8, 1910, (181-10), it being held no invention to substitute such a reproducer as is shown especially in Thoma for the button head of Weber .

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
IMPROVEMENTS IN PHONOGRAPHS,) Room No. 379.
Filed February 23, 1909,)
Serial No. 479,587.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of ^{April 2, 1910} ~~February 23,~~
1909, please amend the above entitled case as follows:

In line 10, page 1, before "filed" insert
Serial No. 479,586.

In line 2, claim 2, before "a" second
occurrence insert the apex of said cone being slightly
rounded in a plane transverse to the record groove - .

Cancel claims 5, 7, 8 and 9 and change the
numerals of claims 6, 10 and 11 to 5, 6 and 7 respectively.

In line 7, claim 6, former claim 10,
before "substantially" insert the angle included between
the sides of the V being approximately 93° - .

In line 8, claim 7, former claim 11,
before "substantially" insert the angle included between
the sides of the V being approximately 93° - .

Add the following as claim 8:

8. As a new article of manufacture, a phono-
graph recording stylus having a conical lower end, the
apex of said cone being slightly rounded in a plane
transverse to the record groove, and the material of

said cone being cut away from the front of said stylus to form a forward face extending from the apex of the cone slightly to the rear of the axis of the cone for a short distance above the apex, substantially as described.

R E M A R K S.

Reconsideration and allowance of the claims as amended are respectfully requested.

The angle included between the cutting edges of Bruening's recorder as shown in Figure 7 of his patent of record is very much less than 90° and is apparently approximately 60°. An inclination of substantially 90° appears to be necessary for the production of records having substantially 400 threads to the inch, this fact having been determined by a series of experiments. Furthermore, the recorder of Bruening is not specifically described in the specification and was evidently not designed for the use contemplated by the applicant. Referring to claims 2, 5 and 6, none of the patents of record shows a stylus whose bearing surface is V-shaped with a rounded apex in a plane transverse to the record groove and curved in a plane parallel to the record groove. Thom's disc 15 is described in line 47, page 2, of his specification as having the form of a knife edge and not as having a rounded apex as specified by above named claims. Now claim 6 contains as a limitation, a statement as to the manner in which the material of the cone is cut away to form the forward face of the recording stylus. This feature is thought to be novel.

Attention is again directed to the remarks
accompanying the last amendment.

Respectfully submitted,

Orange, New Jersey,

THOMAS A. EDISON,

March 15th 1911.

By Frank L. Dyer
His Attorney.

56 a Daxnton Road, Balham, S.W
London March 28th 1911.

Thomas Graf Esq.,
Clerkenwell Road, E.C.

Dear Sir,

I have the pleasure to hand you herewith particulars of our new record.

Referring to records generally, I would say that there are three "cuts" known to the talking machine world. The parallel cut which was made by the Graphophone or Volta Co. in 1886. This cut was possibly anticipated by Mr. Edison in his patent 1644 of '78. However, the Volta cut was the "method" of the vibrations in a parallel track with the undulations at the bottom of the track.

The fault of this track was that the reproducing point got huddled on the side walls which set up an interference and stopped the vibrations from passing molecularly or permissibly through this point.

In 1888 Mr. Edison invented the H. cut which gives the method at the bottom of the track as well as at the sides. This cut is reproduced by means of a ball point. If a ball be not used then a point which must get down to the bottom of the record and at the same time cover the sides. This track is very shallow. In making this record on a disc it has been found that when made very fine, there is a tendency of the cutters to overlap the track and cut into the next track so that in reproducing there is a tendency to echo. If the cutters be very fine and of less width than the track or pitch of thread, then as a rule there is no volume. In short it has been found that the finer the H track the less is the volume.

There is the third cut which is called the "Berliner" or Zig Zag cut. This does not permit of a fine cut, because the loss of volume is very great as the cut is made finer or the pitch of thread decreased. Further very loud records have very little life in this cut, because the walls being parallel, the to and fro motion of the cutting tool, cuts away the walls, so that on reproduction these walls being weak, are soon broken down.

We have invented a new cut altogether and which has many advantages over anything that has been done before. It is a phono cut which WILL NOT PLAY WITH A SAPPHIRE. We have found that the actual part of a record which effects reproduction is that which causes either an up and down motion of the diaphragm or a to and fro motion in an upright reproducer. We make our record with a V shaped tool and reproduce the record with a needle which is considerably finer than the V and our reproduction comes from the bottom of the track and not from the sides. This lessens scrape and noise and gives great volume and

that "grip" in the reproduction which the public seem to look for.

We have been over three years experimenting along the lines which have resulted in our present patents.

We have patents in the following countries:- England, France, Belgium, Germany, Austria, U.S.A. and we have rights under the convention to apply for patents in all other countries before the 1st of October next.

We have had Counsel's opinion on our patents and a search has been made in all countries for prior publication of our system and we haven't been able to find it. The effectiveness of our record is due to the fact that it is reproduced with a tool which is of less width than the groove or track and has a very fine point. The German Patent Office, after a very full investigation, lasting some considerable time, granted our claims in full-- even to the V cut as they held no one else had ever proposed to make a V cut record and reproduce it with a sharp pointed stylus or needle.

The advantages of our record are that we can get twice the time as on a Zig Zag cut record. We record at 60 revolutions per minute so that our record will play on all Gramophones and Victor machines without the necessity of altering the Motor, as it is now the case where it is desired to play Phono cut records--such as Edison, Gramophone, etc. Thus our records are available to all users of Gramophone, and in order to get into the market, we do not have to create a demand for the records by the sale of machines as others have had to do.

In the manufacture of these records the track being of V shape, the matrix comes away from the "stock" quite easily, and as you will see by the samples sent you leaves a bright and strong surface. In the Zig Zag track records the tool, very often undercutting the track, there is a slight tearing away of the walls in places, which causes a roughness and corresponding unpleasantness in the reproduction.

As regards the life of our record. On a Zig Zag record the wear test is 50. This is the standard of the Gramophone Co. and the Columbia. Many of the Continental Companies have no wear test and their records break down in half a dozen reproductions and especially in this the case if a thick or loud needle be employed.

With the record it will be found that the wear test is phenomenal. Certainly it is far ahead of anything that has been done up to the present. Naturally a good deal depends upon the stock but I have found with ordinary records, that immediately you harden up or strengthen the stock, you introduce scrap. You can make our record of steel and with the sharp needle point you will not increase scrap. Therefore, I see no reason why our record should not give a wear test running into thousands.

We will sell our patents, show you how to do the recording and give you all and every information in our power for the sum of Ten thousand pounds. If you would like me to come over to America and see you on the subject, I shall be willing to do so, but the terms I have mentioned must be the basis of our negotiations.

HOW TO PLAY OUR RECORDS.

We prefer to use a machine like the new model "Sonora" which is made by Pathé in Switzerland and is sold by the Sonora Co. in New York, or a Pathe Machine. We do not use a sapphire so that must be removed from the box, and, if you will notice a modern Pathe box, you will see there is a place for a screw cap to cover the sapphire. We file off that screw part and pass a drill down the hole which holds the sapphire capsule, so that the needle will go in easily. The needle should project about a quarter of an inch or less but not much less.

I am sending you some records. I have tested them and they are all and I think you will admit I ought to know want a good record is, if, therefore, you do not get good results, look to the reproducer. Of course, I take it you understand that the reproducer is used Phonograph fashion. Try and get a Pathe machine. For the Gramophone or Victor machine we make an Adapter. This not only permits of the reversal of the Sound Box but brings the needle point in line with the center pin which is the correct position.

AS REGARDS NEEDLES.

We exact a fine needle. The Melba needle is a good needle and there are many fine needles to be had. We have our needles made of Silver steel and they are as hard again as the general run of needles sold here outside the Gramophone Company. DON'T USE TOO THICK A NEEDLE AS WE DO NOT WANT IT TO TOUCH THE SIDES.

Kindly note that it is not desirable to drop the repro. or Sound Box down on the record in any position. You can do this with a cylinder because the Repro. has the sapphire suspended and is resilient but with the Sound Box it comes down hard and brutal and is likely to hit the record on the top of a wall and so break it away. This is not anything in the way of special precaution with our records but it applies to all records which are played with a needle. Further we recommend that the needle should be run a few times on the hard material before it is run in the groove. This takes the burr off.

Notice that our record can be played with the machine at an angle of 45 degrees. This can't be done with a Phonograph record and thus phonograph records are debarred from being used on board ship.

The last word is that if you don't get the best results-- even as you, with all your sense of quality know them-- then look to the reproducing methods.

I am sending you 3 records and 2 Matrix of so that you can press a record in your own special material for trial. I am also sending an Adapter for use on Victor machines.

Yours faithfully,

J. LEWIS YOUNG.

Div. 22, Room 379

2-280

Paper No. 6, Rej.

Address only
The Commissioner of Patents,
Washington, D. C.
U. S. D. - P.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

April 15, 1911.

456
Thomas A. Edison,
Care Frank J. Dyer,
Orange, New Jersey.

Edison Laboratory.

Please find below a communication from the EXAMINER in charge of your application.

#479,587, filed Feb. 23, 1909, for Phonographs.

E. B. Moore.

Commissioner of Patents.

This action is responsive to the amendment filed March
16, 1911.

Claim 1 is rejected upon Bruening of record or Novelvey,
May. 1, 1896, 531,690, (181-10). Bruening's recorder may well
include an angle of about 90 degrees. Novelvey's recorder is
described as containing an angle of 90 degrees. It is held
patentably immaterial whether the recorder include an angle of
90 or 95 degrees as it is believed the device will still be
operative including the lesser angle.

Claim 2 is rejected upon Von Wouwermann, German patent,
104,718, Aug. 23, 1899, (181-10). The claim is also rejected upon
Novelvey or Bruening, in view of Bell, et al., of record, Edison,
June 26, 1900, 652,457, (181-10), or Von Wouwermann cited. No
invention can be found in cutting a face upon the cone at or rear-
ward of the axis as in Tainter or others cited.

Claim 3, line 8 and 9, "acially or rearwardly of the
axis", is objectionable as alternative. This claim is rejected
upon Novelvey or Bruening, in view of Von Wouwermann or Bell, et
al.

Claim 4 is rejected upon Thomas of record, in view
of Novelvey or Bruening and the claim is also rejected upon

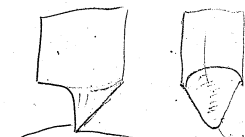
#479,597-----2.

VonWouwermann.

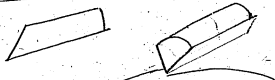
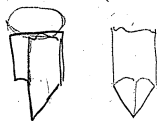
Claim 5 is rejected upon Von Wouwermann, or Thoma, or Weber, in view of Movelvey or Bruening.

Claims 6 and 7 are rejected upon Movelvey, Bruening or VonWouwermann in view of weber. No invention can be found in conforming the head of weber's stylus to a groove as would be cut by the recorder of the other references cited.

Claim 8 is rejected upon VonWouwermann and also upon Movelvey or Bruening, in view of Edison or Bell.



$\frac{1}{2}$ center

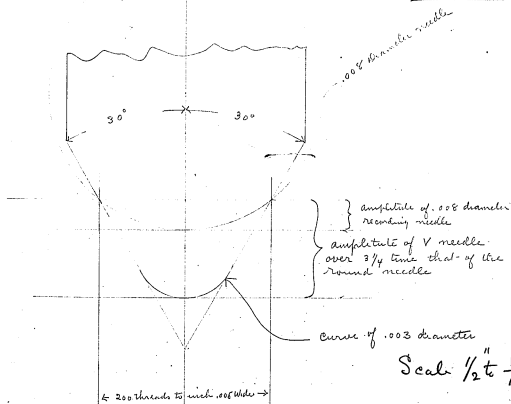


Explained to me by
Mr. K. Miller May 20, 1911
H. Bachman

Explained to me
by Mr. K. Miller May 20, 1911
H. Bachman

Examined by me by.
H. H. Miller May 24, 1911.

H. Bachmann



Scale $\frac{1}{2}$ " to $\frac{1}{1000}$ "

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
IMPROVEMENTS IN PHONOGRAPHS,)
Filed February 23, 1909,) Room No. 379.
Serial No. 479,587.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of April 16,
1911, please amend the above entitled case as follows:

Rewrite claims 1 and 2 as follows:

1. As a new article of manufacture, a phonograph
recording stylus having straight cutting edges inclined to
each other and extending upwardly and slightly rearwardly
from the cutting extremity of the stylus, substantially
as described.

2. As a new article of manufacture, a phonograph
recording stylus whose cutting edges comprise two straight
portions inclined to each other and a curved portion con-
necting said straight portions, said cutting edges extending
upwardly and slightly rearwardly from the cutting extremity
of the stylus, substantially as described.

In line 7, claim 3, change "a forward face" to
- cutting edges - ; and in line 8, same claim, cancel
"axially or".

Cancel Claim 4 and insert the following as
new claim 4.

4. As a new article of manufacture, a phonograph
recording stylus whose cutting edges comprise two straight
portions inclined towards each other at an angle of

B' substantially 93° and the curved portion connecting said straight portions, said cutting edges extending upwardly and slightly rearwardly from the cutting extremity of the stylus, substantially as described.

Rewrite claims 6 and 7 as follows:

B² 6. In a phonograph reproducer, a stylus lever, means for supporting said lever parallel to the record groove, a stylus carried by said lever with the shank thereof extending transversely to the plane of the lever, the said stylus having a head curved in a plane parallel to the record groove and provided with a bearing surface whose section in a plane transverse to the record groove has the shape of the letter V provided with a rounded apex, the angle included between the sides of the V being approximately 93°, substantially as described.

7. In a phonograph reproducer, a stylus lever, means for supporting the said lever parallel to the record groove, a stylus carried by said lever with the shank thereof extending transversely to the plane of the lever and parallel to the surface of the record, the said stylus having a head curved on the arc of a circle in a plane parallel to the record groove and provided with a bearing surface whose section in a plane transverse to the record groove has the shape of the letter V provided with a rounded apex, substantially as described.

REMARKS

The references of record have been carefully considered and the claims (except claim 5) have been revised to differentiate applicant's invention therefrom. Claim 5 is thought to be allowable without revision.

Referring to claims 1 to 4 inclusive, none of the references of record discloses a recording stylus having straight cutting edges inclined towards each other and extending upwardly and slightly rearwardly from the cutting extremity of the stylus. In the patent to McKelvey, the edges of the stylus are inclined forwardly; and as a consequence, the tendency of this stylus would be to ride up out of the record material onto the surface thereof. In the structure of Bruening, the same defect exists. Neither of these patents shows a cutting edge having the curved cutting portion specified in claims 2, 3 and 4. In VonWouwermann, Bell, et al., Edison, 652,457, there are no straight cutting edges; nor does any of these patents disclose cutting edges extending upwardly and rearwardly from the cutting extremity of the stylus.

Referring to claims 5 to 7 inclusive, the patents to VonWouwermann and Weber do not disclose a stylus whose bearing surface is V-shaped in a plane transverse to the record groove. As pointed out in the specification (see last paragraph on page 2) a groove whose walls are curved transversely of the same, as is true of Weber's and VonWouwermann's groove, is impracticable for records

having four hundred threads per inch; "because the side walls are too thin or narrow to have the requisite strength needed in molding and reproducing." Thoma's reproducer and McKelvey and Bruoning's recorder are not provided with apexes rounded transverse to the record groove; but have sharp or pointed record engaging portions which would wear away the record groove in a short time. The applicant's reproducing stylus appears to be essentially different from prior styluses, and it is thought that it could not be produced by any modification of the structures disclosed in the references without the exercise of invention.

Reconsideration and allowance are accordingly respectfully requested.

Respectfully submitted,

Orange, New Jersey,

THOMAS A. EDISON,

March 26, 1912.

By

Frank L. Byers
his Attorney.

Div. 23 Room 379

2-280

The Commissioner of Patents,
Washington, D. C.

Paper No. 8, R. 0. 1
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

April 24, 1912.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.
Care Edison Laboratory.

U. S. PATENT OFFICE
APR 24 1912
MAILED.

Please find below a communication from the EXAMINER in charge of your application.

for Phonographs, filed Feb. 23, 1909, serial number 479,587.

H56

E. B. Moore.

Commissioner of Patents.

H57

This action is responsive to the amendment filed March 27, 1912.

Claims 1, 2, 3, 4 and 8 are specific to the recording stylus, while claims 5, 6 and 7 are specific to the reproducing stylus. Applicant is entitled to claim more than one modification specifically in the same application, see ex parte Eagle, C.D., 1870, 136 and division is required according to the provisions of Rule 42.

Claims 1 and 2 are rejected as displaying no invention over Bell, et al., of record, see page 3, lines 67 to 71 inclusive. It is a well known expedient in all arts employing cutting tools to give the cutting edge a slight backward incline. This is true as well in the talking machine art as see White, June 10, 1890, #429,827, (181-2), or German patent to Godecker, March 28, 1893, #67,554, (181-10); accordingly it is not seen that invention is displayed in cutting Bell's stylus slightly back of the axis. For similar reasons claims 1 and 2 are also rejected on McKelvey of record.

Claims 3 and 4 are rejected upon the references and for the reasons above given. Invention is not found in making the angle

#479,587-----2.

of the cone a quantity approximately old in the art as in McKelvey or Von Wouwermann of record. In McKelvey, the angle is 90° and in Von Wouwermann, it is approximately 90° . Unless applicant can show that some new result has been obtained by using 93° that was not obvious from the prior use of 90° , it is believed that applicant is not entitled to a claim which depends for its patentable limitation on the selection of a specific angle.

Claim 4 is objectionable as the cutting edges are not included positively.

Claim 4, line 4, "the" should be a.

Claim 5 is rejected upon Thoma of record and also upon Weber of record in view of Von Wouwermann or Edison, #552,457, of record, Figure 7. It is not seen that invention is involved in shaping Weber's stylus to conform to the given record groove in view that styli of approximately that angle are shown to be old.

Claims 6 and 7 are rejected upon the references and for the reasons of rejection of claim 5, in connection with the references and reasons of rejection of claim 1.

Claim 8 is rejected upon the references and for the reasons of rejection of claim 1.

✓ 20 21.11.34
13 26, JPC

Folio No. 457

Serial No. 479,586

Applicant.

Thos. A. Edison

Address.

Title

Sound Records

Filed

February 23, 1909.

Examiner's Room No.

379.

Assignee.

Ass'g't Exec.

Recorded

Liber

Page

Patent No.

Issued

ACTIONS.

- | | | | |
|----|-------------------------|----|-----------------------|
| 1 | Repealed Mar. 19, 1909 | 16 | |
| 2 | Amended Mar. 18, 1910 | 17 | |
| 3 | Repealed April 2, 1910 | 18 | Dropped as far |
| 4 | Amended March 15, 1911 | 19 | as amendments written |
| 5 | Repealed April 15, 1911 | 20 | below by Mr. Edison |
| 6 | Amended Mar. 26, 1912 | 21 | March 6-1913 |
| 7 | Repealed April 24, 1912 | 22 | |
| 8 | | 23 | |
| 9 | | 24 | |
| 10 | | 25 | |
| 11 | | 26 | |
| 12 | | 27 | |
| 13 | | 28 | |
| 14 | | 29 | |
| 15 | | 30 | |
- Stamp: **VAULT**

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, West Orange, County of Essex, New Jersey

prays that letters patent may be granted to him for the improvements in

SOUND RECORDS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration No. 560), of Orange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thomas A. Edison

- SPECIFICATION -

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN that I, THOMAS A. EDISON, a citizen of the United States, and a resident of Llewellyn Park, West Orange, County of Essex and State of New Jersey, have made a certain new and useful invention in SOUND RECORDS, of which the following is a description:

My invention relates to various improvements in sound records, and my object is to provide a sound record of superior quality and so relatively condensed that a much more extended reproduction may be secured from a cylinder of standard dimensions than is now possible.

As phonograph records have been chiefly made in commercial practice heretofore, a circular edged recorder having a diameter of about .040 inch is engaged with a rotating blank, so as to track very slightly below the surface, the surface speed of the blank being upwards of 90 feet per minute, and the recording spaces being only 1/100 of an inch in width. This produces the standard record having 100 threads per inch. In my previous application Serial No. 350,646, filed January 3, 1907, I describe a sound record made with a circular edged recorder having a diameter of about one quarter that of the recorder which, as previously described, is used to make the 100 thread records. In the application No. 350,646 above referred to, the record is made on a recording machine having a feed screw which preferably has a pitch of 200 threads to the inch. This cuts a record to

a suitable depth in a space $1/200$ of an inch wide instead of $1/100$ of an inch, the improved record so made having, therefore, 200 threads to the inch. In the case of both the standard 100 thread record and the improved 200 thread record made with a recorder as just described, the deepest depressions which can be formed without overlapping upon the adjoining spaces are extremely shallow, being about $6/10,000$ of an inch in depth. In the case of the 100 thread record, the width of the record groove is about sixteen times the maximum depth, and its walls are of such slight curvature that difficulty is experienced in tracking the record, unless the reproducer stylus is mounted with great flexibility. In the case of the improved 200 thread record of application Serial No. 350,646, the ratio of width to depth above referred to is cut in half, becoming approximately 8 to 1.

In endeavoring to produce a record having substantially more than 200 threads per inch, for example, 400 threads per inch with a circular edged recording stylus, various difficulties present themselves one of which is the production of a cutter of sufficiently small size to cut such a narrow groove to a desirable depth, and furthermore such a groove even when produced does not make a practical record because the side walls are too thin or narrow to have the requisite strength needed in molding and reproducing.

According to the present invention I use a cutting stylus having straight inclined side edges, preferably slightly rounded at the bottom or point. I am aware that V-shaped cutters have been used heretofore for the production of record grooves, but the angle between the cutting edges, so far as I am aware, has not been such as to pro-

duce a desirable record groove. I have determined the proper angle to be used in order to produce the best results, particularly in a groove having 400 threads to the inch, which angle should be approximately 93 degrees between the two cutting edges of the recorder, and the same between the sides of the record groove or $46\text{-}1/2$ degrees between one of the cutting edges and the median line of the cutter, and the same between one of the sides of the groove and a plane drawn perpendicular to the record surface parallel to the groove. When this angle is used, the point of the stylus is rounded on a curve whose diameter is .001 inch which is a suitable curve for records of such pitch.

This angle may be varied slightly under differing conditions while securing the advantages of the invention, as for instance, when the diameter of curvature of the point of the stylus is changed, but I recommend the angle and curvature above mentioned as being those best suited for 400 thread records.

In a groove produced by such a stylus and having 400 threads per inch, the ratio between the width of the groove and its maximum depth is approximately 2.5 to 1. Such a record groove has clearly defined side walls of sufficient strength to enable it when molded to be removed from the mold without injury to the side walls and to enable it to be tracked by a reproducer stylus.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming part of this specification and in which -

Figure 1 is a transverse section, greatly enlarged, of a record groove formed in accordance with my

invention.

Figure 2 is a similar view on a smaller scale, but still greatly enlarged, and showing my improved recording stylus in position for forming the groove.

Figure 3 is a side elevation of the recording stylus, and

Figure 4 is a front elevation of an improved reproducer stylus for tracking the improved record groove.

The recording stylus 1 which may be of sapphire or other suitable material is a cylinder whose axis is normal to the record surface and whose lower end is formed as a cone 2, the apex of which is rounded on a spherical curve 3 whose diameter may be .001 inch.

The cutting edges 4 are formed by removing material from the cone 2 on a curve extending beyond or to the rear of the axis of said cone, as shown in Figure 3. The lines forming said edges are substantially straight lines and they are inclined toward each other at an angle of approximately 93 degrees, that is, each cutting edge forms an angle of $46\frac{1}{2}$ degrees with the axis of the recorder. Such a recorder will form the record groove 7 of Figure 1, having side walls 5, which are inclined toward each other at an angle of approximately 93 degrees, and the bottom 6 of which is rounded on a circle whose diameter is .001 inch.

A suitable reproducer stylus for tracking the record groove 7 is shown in Figure 4. It is of sapphire or other suitable material and comprises a shank 8, neck 9, and head 10, all circular in transverse section. The head 10 is formed with a bearing surface having conical walls 11 inclined toward each other at an angle of ap-

proximately 93 degrees, or an angle of $46\frac{1}{2}$ degrees to the perpendicular, and rounded at the plane of intersection on a curve or circle whose diameter may be .001 inch.

The stylus should be held with the shank transverse to the record groove similarly to the stylus disclosed in the ~~application of Peter Weber filed October 8, 1908, Serial No. 456,701.~~ *Patent for Peter Weber No. 951,496 granted March 8, 1910*

The improved recorder and reproducer herein shown are claimed in my application Serial No. ~~478,787~~ *478,787* filed concurrently herewith.

Having now described my invention, what I claim and desire to secure by Letters Patent, is as follows:

1. As a new article of manufacture, a sound record formed with a continuous ~~spiral~~ *helical* record groove having side walls whose elements are substantially straight lines inclined toward the perpendicular bi-sector of the record groove at an angle of approximately $46\frac{1}{2}$ degrees, substantially as set forth.

2. As a new article of manufacture, a sound record formed with a continuous ~~spiral~~ *helical* record groove having a ~~rounded bottom~~ *concave* and side walls whose elements are substantially straight lines inclined toward the perpendicular bi-sector of the record groove at an angle of approximately $46\frac{1}{2}$ degrees, substantially as set forth. *Quest A. claims 2-3 3/4/10*

3. As a new article of manufacture, a sound record formed with a continuous ~~spiral~~ *helical* record groove whose pitch is approximately one four hundredth of an

~~Cancelled~~ *The pitch is rounded bottom and*
inch and having side walls whose elements are substantial-
ly straight lines inclined toward the perpendicular bi-
sector of the record groove at an angle of approximately
the pitch is between the maximum width and depth of the groove
46-1/2 degrees, substantially as set forth, *being less than 45°*

4. As a new article of manufacture, a sound
record formed with a continuous *helical* record groove
whose pitch is approximately one four hundredth of an
inch and having a *rounded* bottom, and side walls whose
elements are substantially straight lines inclined toward
the perpendicular bi-sector of the record groove at an
the pitch is between the maximum width and depth of the groove being approxi-
angle of approximately 46-1/2 degrees, substantially *46-1/2°*
as set forth.

This specification signed and witnessed this 18th day of February 1909.

Thomas A. Edison

Witnesses:

1. Frank L. Dyer
2. Dyer Smith

Oath.

State of New Jersey } ss.
County of Essex

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Melwelln Park, West Orange, Essex County, New Jersey

that he verily believes himself to be the original, first and sole inventor of the improvements in

SOUND RECORDS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 18th day of February 1909.

Anna R. Allen

Notary Public.

NOTARY PUBLIC, STATE OF NEW JERSEY
COMMISSION EXPIRES, JUNE, 1913.

457

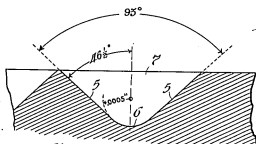


Fig. 1

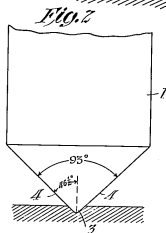


Fig. 2

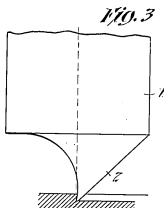


Fig. 3

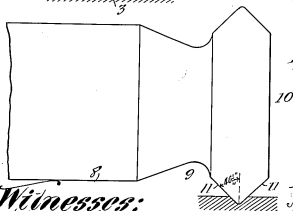


Fig. 4

Witnesses:

Frank O. Lewis
Dyer Smith

Inventor:

Thomas H. Edwards
by Frank L. Dyer

Atty.

457

Div. 23, Room 379
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."
J. H. D. - 51.

2-260.

Paper No. 2-Ref.
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

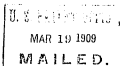
DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

March 19, 1909.

Thomas A. Edison,
care Frank L. Dyer,
Orange, New Jersey.

Care Edison Laboratory.



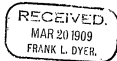
Please find below a communication from the EXAMINER in charge of your application,
for Sound Records, filed February 23, 1909, serial number 479,886.

E. B. Moore

Commissioner of Patents.

The claims are rejected in view of the patents of
Bell and Tainter, #341,214, ^{see file 1176} May 4, 1886, (181-5), and Tainter,
July 10, 1888, #385,886, (181-5) and Von Wouwerman's British Patent
#19,361, ^{see file 1176} of 1897, (181-2).

The particular shape of applicant's record groove
appears to be old in Von Wouwerman's patent. To provide a record
tablet with four hundred or any other number of these grooves
to the inch, does not seem to constitute invention.



James

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison :
SOUND RECORDS : Room No. 379.
Filed February 23, 1909 :
Serial No. 479,586 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to rejection of March 19, 1909, please amend this case as follows:

✓ Page 5 of the specification, lines 7 and 8, erase "application of Peter Weber filed October 8, 1908, Serial No. 456,701" and substitute - patent of Peter Weber No. 951,496, granted March 8, 1910. - .

✓ Claim 1, line 2, substitute - helical - for "spiral" before "record".

✓ Claim 2, line 2, substitute - helical - for "spiral" before "record".

✓ Claim 3, line 2, substitute - helical - for "spiral" before "record". ✓ Line 7, after "degrees" insert - the ratio between the maximum width and depth of the groove being less than 4 to 1 - .

✓ Claim 4, line 2, substitute - helical - for "spiral" before "record". ✓ Line 7, after "degrees" insert - the ratio between the maximum width and depth of the groove being approximately 2-1/2 to 1 - .

R E M A R K S

Reconsideration and allowance of the claims as amended are respectfully requested. It is submitted that applicant's claims define a sound record having elements of novelty sufficient to confer patentability thereupon. In the British patent to Von Wouwormans cited, the record groove does not have side walls whose elements are substantially straight lines inclined at an angle, since his groove is oval or elliptical in section. The patent to Bell & Tainter cited discloses a well known form of cutting stylus, in which a needle or wire is ground to a point to cut the groove. A groove formed by such a cutting stylus would not fulfill all the conditions required by applicant's construction, in which the groove must be of extremely microscopic character, have well defined side walls, have a proper depth to insure a sufficiently loud reproduction, and be of such a character that it can be tracked properly by a practical reproducer stylus in reproducing from the same. These various considerations have resulted in the formation of a record groove having an angle which is given approximately in the claims and having a certain ratio between the width and depth which is recited in certain of the claims. In forming a record groove having 400 threads to the inch, it was found that a groove having a circular or curved cross section would not leave sufficiently well defined side walls to permit the same to be manufactured and remain unbroken, so therefore the structure of the British patent would not do. The recording stylus of Bell & Tainter does not even approximate the proportions re-

quired by applicant and would not make a practical groove which would serve applicant's purpose. It may also be noted that as shown in Figure 6 of the patent drawings, the sides of the recording stylus are curved and not straight lines.

Respectfully submitted.

THOMAS A. EDISON

By Frank L. Dyer

His Attorney.

Orange, New Jersey

March 18th, 1910.

157

Div. 23 Room 370

THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

J.H.D. -S.

2-280.

Paper No. 1111

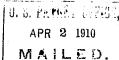
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

April 2, 1910.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey .



Please find below a communication from the EXAMINER in charge of your application.

for Sound Records, filed Feb'y. 23, 1909, serial number 479,586 .

Confidential
Don't

E.B. Moore.

Commissioner of Patents.

This action is responsive to the amendment filed March
19, 1910.

Page 5, line 10, insert the omitted serial number .

Claims 1 and 2 are rejected upon the patent to Bruening,
November 10, 1891, #462,687, (181-5), or Von Wouwerman of record.
Bruening's recorder is apparently from the disclosure in the
drawing, approximately 90 to 93 degrees between the inclined
sides. It is held no invention to so modify Bruening's recorder as
to make it exactly 93 degrees, this being held but a modification
of form not within the scope of patentable subject matter. To round
the point is held to be no invention in view of Von Wouwerman .

Claims 3 and 4 are rejected upon Bruening cited, in view
of Von Wouwerman cited. The limitation as to the ratio of
maximum width and depth is held not to give a patentable limitation
to these claims inasmuch as it is believed that if applicant's
conical pointed recorder will produce a record groove of such
ratio, that Bruening's recorder will necessarily produce a record
groove of approximately the same ratio .

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,
SOUND RECORDS,
Filed February 23, 1909.
Serial No. 479,586.

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of April 2,
1910, please amend the above entitled case as follows:

In line 10, page 5, after "No." insert
479,587 .

In line 4, claim 4, cancel "rounded" and
after "between" insert rounded on an arc having a radius
of approximately .0005 of an inch.

R E M A R K S.

Reconsideration and allowance of the
claims are respectfully requested.

Referring to Figure 7 of the patent to
Bruening, it appears that the sides of the cutting point
of Bruening's recorder are inclined to each other at an
angle of approximately 60° rather than at an angle of 90°
as stated by the Examiner. None of the references of
record shows a reproducer having cutting edges which are
straight lines inclined to each other at an angle of

approximately 93°. Furthermore, none of the references makes any statement as to the inclination of the sides of the recorder or the record groove, nor to the use for which the applicant's invention was designed. The angle specified in the claims was determined by a series of experiments and is apparently necessary for production of the record groove having 400 threads to the inch. It appears that the applicant has conceived a new invention and it is thought that this invention as defined in the claims is patentable.

Claims 2 and 4, in addition to defining a new inclination for the sides of the record groove, describe the latter as provided with a rounded bottom. The recorder shown by Bruening comes to a sharp point so that obviously it could not cut a groove with a rounded bottom.

Claim 4 specifically states the curvature of the bottom of the record groove.

respectfully submitted,

Orange, New Jersey,

March 15th 1911.

THOMAS A. EDISON,

By Frank L. Boyer
His Attorney.

Div. 25 Room 379

The Commissioner of Patents,
Washington, D. C.

J. H. D.-S.

2-200

Paper No. 1

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

April 15, 1911 .

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey .

Edison Laboratory .



Please find below a communication from the EXAMINER in charge of your application.

#479,586, filed Feb. 23, 1909, for Sound Records .

457

E. B. Wilson

Commissioner of Patents.

This action is responsive to the amendment filed March 16, 1911 .

Claims 1 is rejected upon Bruening of record, or McElvey, January 3, 1895, 531,690, (181-10); Bruening's recorder may well be around 90 degrees in inclination between its sides; McElvey's recorder is described as including an angle of 90 degrees between its sides. It is held patentably immaterial whether the angle be 90 or 93 degrees as it is believed that the device would still be operative including but 90 degrees.

Claim 2 is rejected on the cited art in view of VonWouwerman , of record. It is held there is no invention in rounding the point of Bruening or McElvey's recorder in view of VonWouwerman .

Claim 3 is rejected upon either Bruening or McElvey and claim 4 upon Bruening or McElvey in view of Von Wouwerman . Patentable subject matter is not found in the specific radius of a curvature at the point of the stylus .

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
SOUND RECORDS,)
Filed February 23, 1909,) Room No. 379.
Serial No. 479,586.)

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to Office action of April 15, 1911, please amend the above entitled case as follows:

In line 3, claim 2, after "a" insert
- transversely - .

Cancel claims 1, 3 and 4, and change the
numeral of claim 2 to 1.

Add the following as claims 2 and 3.

2. As a new article of manufacture, a sound record formed with a continuous helical record groove whose pitch is approximately one four-hundredth of an inch and having a transversely rounded bottom and side walls whose elements are substantially straight lines inclined towards the perpendicular bi-sector of the record groove at an angle of approximately $46\frac{1}{2}$ degrees, the ratio between the maximum width and depth of the groove being approximately $2\frac{1}{2}$ to 1, substantially as set forth.

3. As a new article of manufacture, a sound record formed with a continuous helical record groove whose pitch is approximately one four-hundredth of an inch and having a bottom rounded transversely on an arc having a radius of approximately .0005 of an inch and side walls whose elements are substantially straight lines inclined toward

the perpendicular bi-sector of the record groove at an angle of approximately $46\frac{1}{2}^{\circ}$, the ratio between the maximum width and depth of the groove being approximately $2\frac{1}{2}$ to 1, substantially as set forth.

REMARKS

None of the references of record discloses a "record groove having a transversely rounded bottom and side walls whose elements are substantially straight lines"; nor does any of the references suggest the formation of such a groove. This feature of applicant's invention is brought out in all of the claims. The patents to Bruening and McKelvey show pointed recorders which would not form a record groove having a transversely rounded bottom. The patent to VonWouwerman shows a groove with rounded side walls which would be so thin in a record having the large number of threads per inch contemplated by the applicant as to break down in molding and reproducing. As clearly pointed out in the specification, the principal object of applicant's invention is to produce a record having substantially four hundred threads per inch. In accordance with this object, applicant experimented with recording styluses of various shapes and finally discovered that a record of the type in question could be successfully cut, molded and reproduced without the danger of breaking down the side walls of the grooves if the recording stylus were so shaped as to cut a groove of the type set forth in the claims. The reproduction from this record was also found to be of very good quality and volume. None of the references either discloses a record having so large a

number of threads per inch as contemplated by the applicant or indicates how such a record can be successfully produced. A new result has been produced by applicant's invention and the claims clearly point out the novel shape of the groove by which this result is obtained.

Claims 2 and 3, in addition to distinguishing from the references by the features set forth in the first sentence of the above remarks, specifically state that the pitch of the record groove is approximately one four-hundredth of an inch and also that the ratio between the maximum width and depth of the groove is approximately $2\frac{1}{2}$ to 1. Claim 3 further specifies the radius on which the bottom of the record groove is rounded.

Referring to the Examiner's statement that "there is no invention in rounding the point of Bruening or McKelvey's recorder in view of VonWouwerman", it is pointed out that such a modification is not suggested by VonWouwerman or any of the references of record, and that even if such a modification were made, there would not necessarily be produced by the modified stylus a record groove of the type set forth in the claims.

The desirability of making a record capable of such an extended reproduction as that invented by the applicant is thought to be obvious. The applicant is the first to produce such a record; and the means employed and the record produced by him are different from any heretofore known. It is accordingly thought that applicant is entitled to a patent on this invention.

Reconsideration and allowance are respectfully requested.

Respectfully submitted,

Orange, New Jersey,
March 26, 1912.

THOMAS A. EDISON,

By Francis L. Oyer
his Attorney.

Div. 23 Room 379

2-280

Address only
"The Commissioner of Patents,
Washington, D. C."
J. H. D. - S.

Paper No. 100-1
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

April 24, 1912.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.
Edison Laboratory.

U. S. PATENT OFFICE,
APR 24 1912
MAILED.

Please find below a communication from the EXAMINER in charge of your application.
for Sound Records, filed Feb. 23, 1909, serial number 479,586.

E. B. Moore

Commissioner of Patents.

This action is responsive to the amendment filed March 27, 1912.

Claim 1 is rejected upon Bell, et al., of record, see page 3, lines 67 to 71 inclusive. Invention is not found in making the angle of Bell, substantially like that of McKelvey of record, or Von Wouwermann of record unless applicant can show that an angle of 93° ~~ix~~ produces a result not obvious from the prior use of 90°.

Claim 2 is rejected upon the references and for the reasons of rejection of claim 1. The pitch of the groove is held not a patentable limitation. The ratio of the width to the depth is held to give a patentable limitation as such ratio is approximately twice the tangent of 1/2 the angle included at the apex. Therefore given the angle of the cutting tool and the ratio of width to depth is predetermined. The ratio in any of the 90° recorders of record ~~or closely~~ approaches that claimed for applicant's construction.

Claim 3 is rejected upon the references and for the reasons given. The radius of curvature of the point is held to be a ^{more} matter of selection and not involving invention.

See U.S. Pat. 1,026,386

Folio No. 458

Serial No. 481,167

Applicant.

Thos. A. Edison

Address.

Title Phonograph Records (Case A)

Filed March 3, 1909 Examiner's Room No. 379

Assignee New Jersey Patent Co.

Ass't Exec. Sept. 24, 1915 Recorded Liber Page

Patent No. 1,158,659 Issued November 2, 1915

ACTIONS.

- | | | | |
|----|------------------------------|----|-----------------------------|
| 1 | Rejected Mar. 31, 1909 | 16 | Final Fee Paid Oct. 1, 1915 |
| 2 | Amended Mar. 29, 1910 | 17 | |
| 3 | Rejection Apr. 12, 1910 | 18 | |
| 4 | Amended March 28, 1911 | 19 | |
| 5 | Office letter April 28, 1911 | 20 | |
| 6 | Amended Mar. 29, 1912 | 21 | |
| 7 | Office letter May 4, 1912 | 22 | |
| 8 | Amended Apr. 9, 1913 | 23 | |
| 9 | Office letter May 6, 1913 | 24 | |
| 10 | Amended Apr. 3, 1914 | 25 | |
| 11 | Rejected May 23, 1914 | 26 | |
| 12 | Amended May 1, 1915 | 27 | |
| 13 | Rejected May 6, 1915 | 28 | |
| 14 | Amended June 10, 1915 | 29 | |
| 15 | Allowed July 22, 1915 | 30 | |
| | Final fee due Jan. 22, 1916 | | |

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Received
of the
Patent
Office
April 11, 1909

Patent
Filed
February 4 1909
T. W. G.

The object of this invention is to produce phonograph records by the moulding process which shall have a very hard and tough surface whereby more than 200 threads per inch can be attained with the same amplitude of vibration now used on the regular wax like record & without any greater wear.

The invention consists in using a shellac solvent whereby a thin mobile liquid is obtained at such a low temperature that no decomposition of the shellac shall take place this avoiding gas bubbles, pouring this liquid into a matrix mould rapidly rotated

2
+ chilling the same, & afterwards when controlled, removing the same from the matrix -

The best solvent which I have found so far is solid Naphthalene. This is melted & the shellac is stirred into the liquid, any grade & quality of material can be attained by varying the proportions of shellac added to a definite quantity of melted Naphthalene, the hardness will increase as the shellac increases but a point is soon reached when the liquid is too thick to be used practically.

After the record is made, the same gradually changes color from a dark to a light yellow & the hardness & toughness ^{greatly} increases. This is for the reason that there

is a gradual change of the Naphthalene from the amorphous state to Crystalline - There is undoubtedly a segregation to a great extent of the Naphthalene. The resultant is tough and nearly as hard as Celluloid -

If Camphor is used as a solvent when melted for the shellac. There is no such change by Crystallization or segregation & the material remains soft & unavailable -

There are a number of organic solid materials which when melted act as a solvent for shellac to give a clear limpid liquid & but so far I have found none which works as well as ~~shellac~~

Naphthalene for the purpose -

~~Shellac~~
Instead of moulding the record paper may be poured through the liquid & wound tightly as a cylinder of the proper size then cooled over this is coated a thicker layer of the material by dipping - ~~the~~ finally these paper cylinders are placed in moulds & subjected to heat & hydraulic pressure, which the record is impressed on the outer surface & after cooling ~~the~~ is removed from the record matrix

5
Clarin -

The main novelty is
the use of a solvent which
is solid at ordinary temperatures
+ ^{preferably} crystalline - which when
melted into a liquid dissolves
shellac to a perfect liquid
without decomposition +
formation of bubbles

Moulding + the subsequent
change in the record by
segregation + separation of the
two ingredients whereby the
original hardness of the shellac
is regained + the toughness
which the shellac was not
originally possessed attained
by the net work of shellac intermingled
with soft solid ~~temp~~ solvent.

6
which is solid,

After this is a remarkable result
+ produces just what we
want -

Edison

Second Edition
Feb 12, 1909
D.S.

Object of this invention to
make a Record of very hard
material capable of resisting
without more than the usual
wear when the record is made
with 400 threads per inch -
which material can be got in
a molten state & moulded by
the spinning process,
afterwards, cooled & extruded
by calendering or chilling -

The invention consists in
moulding the record from liquid
shellac.

Rendering shellac sufficiently
liquid by the addition of another
material whereby it can be moulded

2
I made fluid without materially
softening the shellac but gives
it desirable toughening qualities
which it does not originally
possess -

The best ingredient to obtain
fluidity is ~~vanilla~~ the highest
grade of very crystalline stearic
acid this is melted & the
shellac added in successive
portions until the right
degree of fluidity for pouring
is attained, this will be
when the proportions are about
15 stearic acid + 30 shellac
depending on the quality of -
the shellac
with 15 stearic acid + 22 shellac
another compound is formed
wherein the stearic acid comes
out as the subject

3

written of another application
beyond this point & when
the shellac is 25 to 15 of
stearic the latter does not
crystallize out & the moulded
material approximates shellac
& is not as hard but when the
shellac reaches 30 to 15 of
stearic it is nearly like
shellac when moulded. But
tougher —

Thus by varying the proportions
of the crystallizing substances
we obtain two distinct
materials which widely
vary in their character

Thus as other substances
which can be added to
shellac to render it fluid

4

So it can be poured & yet
produce a desirable final
product suitable for
moulding Records by
casting —

Acetanilide + Benzoic acid
are samples, but they are not
so cheap or practical as
stearic acid —

Claim a record composed
of shellac & a stearic acid or
other agent, cast from the Mallet
Compound —
Other Claims

REFER TO THIS NUMBER
IN YOUR REPLY

386

FRANK L. DYER,
CHANCE, N. Y.

MEMORANDUM

2/12/09.

Mr. Dyer Smith:

Mr. Edison in speaking to me about the new applications on shellac record compositions, made it clear that he wants to cover two separate things. As I understood him, one is the composition in which shellac is dissolved in a solid solvent such as naphthalene or stearic acid, the proportions being such that the solid solvent will crystalize and practically separate from the shellac so that the record surface is pure shellac. *Wrong* The other is a true mixture of shellac dissolved in a solid solvent under heat, the proportion of the shellac being very much higher than in the first case. Such material is moulded and chilled like any record composition. *PS*

I hand you herewith the first application, which wants to be corrected, and I promised Mr. Edison to let him have both tomorrow afternoon.

FLD/TWW

F. L. D.

Just into
Mr. Z. dir.
9 Davis St. 1899
by J. H. Smith

The best for making amorphous
Shellac lacerals ~~is~~ ^{all} the
principal part of which
is shellac —

is Diphenylamine 15 parts
melted ~~and~~ 70 parts of shellac
put in with vigorous stirring
until all dissolved, the liquid
when the heat is right is
like Malasse — a somewhat
fired with air bubbles, of
now 2 grams of

Acetanilide is added the
liquid becomes clear & more
lumpid, its then ready for use
The second best to get hard
shellac like stuff is 15 Stearic
acid & 50 to 60 shellac with
a small quantity of acetanilide to

2
Make matten mixture more
lumpid — The proportions here
given will vary with the
quality of the shellac used
all over and many brands &
variations. ~~The~~ Naphthalene acts same
way but has a bad odour & smell

As for the yellow material formed
by crystallization it is even harder
than those formed by solution —
in this very much less shellac
is used & it is very much
cheaper —

By using 15 parts of Stearic
acid & only 22 to 24 shellac
dissolving the shellac in the
melted Stearic & keeping the
temperature very low not
above 240 there is no solvent

3

action but an emulsion is
formed of the chocolate in the
Maltol solution -

Before pouring the liquid
the liquid is stirred -

On cooling the stearic acid
crystallizes out & leaves the
chocolate as a net work -

If the temperature is raised
too high or the mix cooked
too long there is gradual
dissolving the stearic down
properly of crystallizing out

A

Amorphous

15 stearic
30 shellac
(+ acetanilide)

Not thicker same
shellac prop.

Best

15 Diphenylamine melle
70 shellac
2 gms or 100

2d best

15 stearic
50% 60 shellac
with acetanilide

B

Cry. telluric
cheaper

15 S. 100
32 A. 28 S. shellac

Temp. not above 240°
emulsion of shellac
in molten stearic

If temp. raised to
too high or too low
Cooked too long, gradual
cooling, & stearic then
property of crystallizing out.

Folio No. 547

Serial No. 526,428

Applicant.

Address.

William T. Edison

Chautauque, N.J.

Title Air Purifier

Filed November 5, 1909

Examiner's Room No. 142

Assignee.

Ass'g't Exec.

Recorded

Liber

Page

Patent No.

Issued

ACTIONS.

1 Rejected Jan. 31, 1910. 16

2 Amended Dec. 29, 1910. 17

3 Rejected Jan. 24, 1911. 18

4 Letter to Office Jan. 19, 1912. 19

5 Office Letter Jan. 25, 1912. 20

6 Amended April 17, 1912. 21

7 Rejected May 15, 1912. 22

8 Amended May 7, 1913. 23

9 Final rejection June 11, 1913. 24

10 25

11 26

12 27

13 28

14 29

15 30

VAULT

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

November 4, 1909

Honorable Commissioner of Patents,
Washington, D. C.

S i r :

Enclosed herewith please find check for \$15.00
filing fee, together with one sheet of drawings and specification in the application of William L. Edison, AIR PUMPS.

Kindly acknowledge receipt, and oblige,

Yours very truly,

General Counsel.

JMC/MI

Encls-

Petition.

To the Commissioner of Patents:

Your Petitioner WILLIAM L. EDISON
a citizen of the United States, residing and having a Post Office address at
Eagle Rock Road, Pleasantdale, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

A I R P U M P S

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration No. 560), of Orange, New Jersey, his attorney, with full power of substitution and reboation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

William L. Edison

S P E C I F I C A T I O N

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, WILLIAM L. EDISON, a citizen of the United States and a resident of Pleasantdale, in the County of Essex and State of New Jersey, have invented certain new and useful improvements in AIR PUMPS, of which the following is a description:

My invention relates to an apparatus for compressing air and storing the same, and the object thereof is to provide means automatically actuated in the operation of an automobile or other vehicle. In my invention I utilize the shock which is constantly imparted to an automobile or other vehicle in passing over cobble stones, rough ground, etc., and also the positive or negative acceleration which is imparted to the vehicle in starting and stopping, to throw into regular movement a member, the motion of which is imparted to suitable pumping apparatus which maintains the pressure in an air tank carried by the vehicle and from which air may be taken at any time for filling pneumatic tires, or for other purposes. Other objects of my invention reside in the combinations of parts and elements of construction hereinafter more fully described and claimed in the appended claims.

Referring to the accompanying drawings forming part of this specification and illustrating a preferred form of my invention, Figure 1 represents a side elevation of my improved device attached beneath the body of an

automobile or other vehicle, parts being shown in cross section. Figure 2 represents an end elevational and cross sectional view taken on line 2-2 of Figure 1.

Referring to the drawings, the air tank 1 is supported from the frame member 2 of the vehicle by means of plates 3, 3 suitably secured to the frame member and the air tank. Cylinders 4, 5 are supported from the lower side of tank 1 by means of brackets or supports 6, 7. Cylinders 4, 5 are axially in line with each other beneath the axis of air tank 1, cylinders 4, 5 being placed fore and aft, that is, one behind the other in the direction of movement of the vehicle.

Ball or weight member 8 is carried by rod 9 pivotally supported at 10 from bracket 11 carried from the lower side of tank 1. Ball 8 and rod 9 therefore constitute a pendulum which is adapted to swing in an arc parallel to the direction of movement of the vehicle, as indicated by the dot and dash lines in Figure 1. The length of the pendulum may be regulated if desired by passing a reduced portion 12 of rod 9 through ball 8, as illustrated, the lower end of reduced portion 12 being screw threaded and having a member 13 screwed thereon to form a supporting means for ball 8. The length of the pendulum may be adjusted by screwing member 13 up or down.

Cylinders 4 and 5 are provided with plungers as 14 slidable therein, these plungers being connected to move together by the common piston rod 15. Pendulum 8, 9 is connected to this piston rod in any suitable manner so that the motion of the pendulum may be caused to actuate the plungers of the cylinders. As shown in the drawings,

common piston rod 15 is provided with a pin 16 which extends within a vertical slot 17 formed in pivoted rod 9. Whenever the vehicle starts or stops or whenever its momentum is checked or accelerated during the operation of the vehicle, the pendulum will be thrown into oscillation, which oscillation causes the reciprocations of the plungers in their cylinders, as noted.

The pump cylinders may be single or double acting as desired, as is obvious, and may be connected with air tank 1 to deliver air into the same in any desired manner. In the drawings, I have illustrated a pair of single-acting cylinders. In the drawings, the cylinders are provided with air inlets as 18 formed in the cylinder heads, the plungers as 14 being provided with passages as 19 therethrough having valves as 20 seated thereon. When piston rod 15 moves to the right, referring to Figure 1, air passes through passage 19, opening valve 20 and filling the space to the left of plunger 14. When plunger 14 moves again to the left, valve 20, which is pivoted as shown at 21, closes and the air is carried before it and swept forward through passage 22 formed in member 23 into tank 1. Member 23 may be attached to cylinder 4 and the tank 1 in any suitable manner, but, as shown, is screw threaded into the tank and to the cylinder 4, forming the rear cylinder head thereof. Tank 1 is illustrated as having an inwardly directed member integral therewith into which member 23 is threaded. ^{To this 47/12} ~~This~~ inwardly directed ~~portion~~ ^{member is secured to member 24 which 47/12} 24 is provided with a continuation of air passage 22, this being formed with a valve seat 25 upon which is seated ball 26 which may be spring pressed, if desired, into contact with its seat by spring 27. The

connections are the same for cylinder 2 to the right hand end of tank 1. Valve 26 and the corresponding valve at the other end of air tank 1 form a means admitting air into tank 1 when the pressure produced by the reciprocation of the pump plungers is greater than that within tank 1, but preventing escape of air past the same from tank 1 at any time. It is, of course, obvious that any suitable valve means might be employed for performing the function of the valves described.

Air tank 1 is provided with a connection 28 by which compressed air may be withdrawn for blowing up a tire or for any other use. While I have shown the pendulum and its cylinders supported from the air tank, it is, of course, obvious that they might be supported from any convenient portion of the vehicle. It is also obvious that any other suitable form of pumping apparatus might be used instead of the particular embodiment described. My invention comprises broadly the provision of a member mounted in any way to receive motion relative to the vehicle from changes in ^{speed} acceleration of the vehicle, this member being connected to any suitable pumping apparatus which tends to maintain the pressure in the air tank. "A reciprocable sliding or rolling member mounted in a suitable guideway might, though with less efficiency, be substituted for the pendulum.

Having now described my invention, what I claim and desire to protect by Letters Patent is as follows:

Revised 11/10 *Inventor - Claims 1-2* *11/10/10*
1. In apparatus of the character described, the combination of a cylinder, a piston therein, a pendulum, and connections between said piston and pendulum, substantially as described.

Continued 11/1/41

2. In apparatus of the character described, the combination of pumping apparatus comprising a fixed member and a member movable relatively thereto, a pivoted weighted member and connections between said weighted member and said movable member, substantially as described.

3. In apparatus of the character described, the combination of an air tank, a cylinder, a plunger therein, means affording a one-way air passage between said cylinder and tank, said cylinder having air inlet means, a pivoted weighted member, and connections between said member and said plunger for actuating the latter from oscillations of the former, substantially as described.

4. In apparatus of the character described, the combination of an air tank, cylinders mounted in alignment, plungers therein, means affording one-way passages between said cylinders and tank, said cylinders having air inlet means, a pivoted weighted member mounted to swing in a plane parallel to the axes of said cylinders, and connections between said member and said plungers for actuating the latter from oscillations of the former, substantially as described.

5. *In apparatus of the character described 11/1/41*
in pumping apparatus for a vehicle, the combination of pumping apparatus comprising a fixed member and a member movable relatively thereto, a member attached to the vehicle, a member mounted to receive motion relative to said last named member from changes in acceleration of said vehicle, and connections between said motion receiving member and said movable pump member for actuating the latter from movements of the former, substantially as described.

Invent B - Claim 5 11/1/41
R " 4-7. incl. 11/1/41

This specification signed and witnessed this 4th day of Nov. 1909.

William L. Edison

Witnesses:

1. Dyer Smith
2. John M. Crawford

Oath.

State of New Jersey }
County of Essex } ss.,

WILLIAM L. EDISON, the above named
petitioner, being duly sworn, deposes and says that he is a citizen of the United
States, and a resident of Pleasantdale, Essex County, New Jersey

that he verily believes himself to be the original, first and sole inventor of the
improvements in

A I R P U M P S

described and claimed in the annexed specification; that he does not know and
does not believe that the same was ever known or used before his invention or
discovery thereof; or patented or described in any printed publication in the
United States of America or any foreign country before his invention or
discovery thereof, or more than two years prior to this application; or patented
in any country foreign to the United States on an application filed more than
twelve months prior to this application; or in public use or on sale in the
United States for more than two years prior to this application; and that no
application for patent upon said invention has been filed by him or his legal
representatives or assigns in any foreign country.

Sworn to and subscribed before me this 4th day of Nov. 1909.

William L. Edison
Anna R. Dehm

Notary Public.

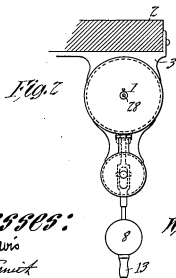
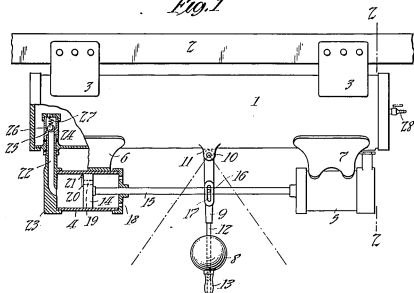
(Seal)

NOTARY PUBLIC, STATE OF NEW JERSEY
COMMISSION EXPIRES, JUNE, 1913.

547

526,428

Fig. 1

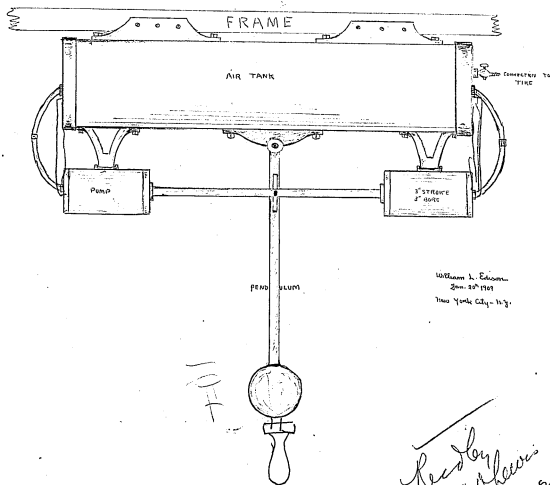


Witnesses:

Paul Davis
Roger Smith

Inventor:
William L. Edison

By Frank L. ...
Atty.



William L. Edwards
 Jan. 20 1909
 New York City - N.Y.

Reddy
 J. D. Hewitt
 July 2 1909

547

Div. 9 Room 142
ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

2-280.

Paper No. 2 J.L.D.
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

W.T.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

January 31, 1910.

William L. Edison,
Care, Frank L. Dyer,
Orange, N.J.

Please find below a communication from the EXAMINER in charge of your application,
for Air Pumps, filed Nov. 5, 1909, Ser. No. 526,428.

E. B. Moore

Commissioner of Patents.

This application has been examined,

The claims are rejected on the following references:-

- ✓ Hutchinson, # 59,226, Oct. 30, 1866, Air & Gas Pumps, Solid Piston, Rectilinear;
- ✓ Price, 568,117, Sept. 22, 1896, 116, Marine Propulsion;
- ✓ Price, 567,999, Sept. 22, 1896, " " "
- ✓ Coates et al. 18,192, Sept. 15, 1857, 114, Bilge Discharge, Ships Motion;
- ✓ Wendell, 233,957, Nov. 2, 1880, 188, Fluid Pressure Railway Brake, Momentum Pump;
- ✓ Mcfinton, 439,302, Oct. 28, 1890, " " "

*Confidential
Smith*

IN THE UNITED STATES PATENT OFFICE.

WILLIAM L. EDISON,)
AIR PUMPS,) Room No. 142.
Filed November 5, 1909,)
Serial No. 526,428.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of January 31,
1910, please amend this application as follows:

Page 4, line 20, change "acceleration" to
speed.

Cancel claims 1 to 4 inclusive, and substitute
the following claims:

1. The combination with a vehicle, of pumping
mechanism 5/7/13
apparatus therefor, and means actuated by changes in speed of
the vehicle for operating the pumping mechanism, sub-
stantially as described.

Cancelled 4/12/14
2. The combination with a vehicle, of pumping
apparatus therefor, and means actuated by the starting and
stopping of the vehicle for operating the pumping mechanism,
substantially as described.

Claim 5, line 5, change "acceleration" to speed.

Re-number claim 5 as 3.

Add the following claim:

3

4. The combination with a vehicle frame, of an air

"1"

tank suspended therefrom, cylinders suspended from the
air tank in alignment with each other, means affording one-
way passages between said cylinders and tank, said cylinders
having air inlet means, plungers in the cylinders, a single
piston rod connected to all of the plungers, and a pivoted
inertia member suspended between the cylinders and ^{the other during its rotation} ~~oppositely~~
~~connected to the piston rod~~, ^{connected with it} the said inertia member being
movable in the line of movement of the vehicle, whereby
relative movement between the said member and the vehicle
frame is produced by changes in speed of the vehicle, sub-
stantially as described.

Second Claim 21-7-11/11

REMARKS.

The references cited by the Examiner have been carefully considered. The patents to Wendell and McMinton show pumping means operated by the vertical movements of a railway car. The patent to Hutchinson shows pumping means operated by the swaying motion of the car. The patent to Price, 568,117, shows pumping means operated by the rolling motion of a ship. The patents to Coates et al and Price 567,999, show pumping means operated by the rolling and pitching of a vessel. None of the references show such means actuated by changes in speed of a vehicle, or by the starting and stopping of the vehicle. This distinction is brought out in the claims as amended. Furthermore, applicant has devised an apparatus which is compact and effective for the purpose described, and the arrangement of the parts is set forth rather specifically

in new claim 4.

Reconsideration and allowance of the case are
requested.

Very truly yours,

WILLIAM L. EDISON,

Orange, New Jersey,
December 29 1910.

By

Frank L. Lyon
His Attorney.

Div. 9..... Room 142

Address only

"The Commissioner of Patents,
Washington, D. C."

2-300

Paper No. 4..... J.L.D.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

547
F.S.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON January 24, 1911.

William L. Edison,

Care, Frank L. Dyer,

Orange, N.J.

Please find below a communication from the EXAMINER in charge of your application.

for Air Pumps, filed Nov. 5, 1909, Ser.No.526,428.

E.B. Moore.

Commissioner of Patents.

This application has been considered as amended Dec. 30, 1910.

Claims 1, 2, and 3 are rejected as involving no invention over
Hutchinson in view of the French patent, both of record.

Claim 4 is rejected on the French patent of record.

547

[FROM HENRY LANAHAN]

January 16, 1912.

Messrs. Bacon & Milans,
908 C Street, N. W.,
Washington, D. C.

Gentlemen:-

In the Office action of January 24, 1911 in the application of William L. Edison for Air Pumps, filed November 5, 1909, Serial No. 526,428, the Examiner rejected Claims 1, 2 and 3 as involving no invention over Hutchinson ~~and~~ in view of the French patent, both of record, and rejected Claim 4 on the French patent of record. Upon taking this application up for amendment, I find that no French patent has been cited. This application is in Division 9, Room 142.

Will you kindly see the Examiner and find out what patent he intended to refer to by the expression "French patent of record". Please advise me promptly in regard to this matter and charge the cost to Thomas A. Edison personally.

Yours very truly,

HL-JS

L. R. BACON
JOSEPH H. MILANS
CALVIN T. MILANS
THOMAS E. HEATH
GEORGE B. RILEY

BACON & MILANS

Counsellors at Law

SOLICITORS IN PATENT AND TRADE-MARK CAUSES
MCGILL BUILDING, 608 G STREET, NORTHWEST
WASHINGTON, D. C.

CABLE ADDRESS
"MOCAN"
LONG DISTANCE TELEPHONE
MAIN 1882

January 18, 1912.

Frank L. Dyer, Esq.,

Orange, N. J.

Dear Sir:-

Referring to your favor of the 16th inst.,
in re Edison application No. 528,428, we beg to
advise you that the French patent referred to by the
Examiner is No. 393431 of 1908.

Very truly yours,

K.

Bacon & Milans

IN THE UNITED STATES PATENT OFFICE

William L. Edison)

AIR PUMPS)

Filed November 5, 1909)

Room No. 142.

Serial No. 526, 428)

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In the Office action of January 24, 1911, the Examiner rejected Claims 1, 2 and 3 as involving no invention over "Hutchinson in view of the French patent, both of record", and rejected Claim 4 on "the French patent of record". On taking up the case for response to this Office action, it is found that no French patent has been cited in the case. Applicant is therefore unable to amend or to present an argument until more definite information has been furnished by the Office. The Examiner is therefore requested to cite the French patent by number, date, name of patentee, etc., as is required by Rule 66.

Respectfully submitted,

WILLIAM L. EDISON

By

Frank L. Lyon

His Attorney

Orange, New Jersey

January 19, 1912.

Div. _____ Room _____
Address only
"The Commissioner of Patents,
Washington, D. C."

2-280

Paper No. _____ of 1912.
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
P.S. UNITED STATES PATENT OFFICE
WASHINGTON January 25, 1912.

William L. Edisech,
Care, Frank L. Dyer,
Orange, N.J.

Please find below a communication from the EXAMINER in charge of your application.

for Air Pumps, filed Nov. 5, 1909, Ser.No.526,428.

E. B. Moore

Commissioner of Patents.

This application has been considered in view of applicant's
letter to the Office filed Jan. 20, 1912.

The data of the French ^{patent} cited in the last Office letter are
French patent No. 393,431 of 1908, Pumps, Solid Reciprocating Piston,
Multiple Cylinder.

547

IN THE UNITED STATES PATENT OFFICE

WILLIAM L. EDISON)

AIR PUMPS)

Filed November 5, 1909)

Room No. 142.

Serial No. 526,428)

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office letter of January 25th, 1912, please amend the above entitled case as follows:-

Claim 4, line 7, erase "operatively" and substitute - having a pin and slot - ; and in line 8, replace "connected to" by - connection with - .

Cancel Claim 2 and renumber Claims 3 and 4 as 2 and 3.

Add the following claims:-

4. The combination with a vehicle, of pumping mechanism therefor comprising a cylinder arranged longitudinally of the vehicle, a piston in said cylinder, a piston rod connected to said piston, and a pivoted inertia member operatively connected to said piston rod and movable in the line of movement of the vehicle, whereby relative movement between the inertia member and the vehicle is produced by changes in speed of the vehicle, substantially as described.

5. The combination with a vehicle, of pumping mechanism therefor comprising a cylinder arranged longi-

itudinally of the vehicle, a piston in said cylinder, a piston rod connected to said piston, and a pendulum having a slot and pin connection with said piston rod, said pendulum being movable in the line of movement of said vehicle, whereby relative movement between the pendulum and the vehicle is produced by changes in speed of the vehicle, substantially as described.

6. The combination with a vehicle, of pumping apparatus therefor comprising a pair of aligned cylinders having plungers therein and a single rod connecting said plungers, and a pendulum having a slot and pin connection with said rod, and operable by changes in speed of the vehicle, substantially as described.

7. The combination with a vehicle frame, of an air tank suspended therefrom longitudinally thereof, cylinders suspended from the ends of the air tank in alignment with each other, said cylinders having air inlet means in their adjacent ends, means affording passages between the opposite ends of said cylinder and said tank, plungers in the cylinders, a single rod connecting said plungers, and a pendulum suspended between the cylinders and having a slot and pin connection with said rod, the said pendulum being movable in the line of movement of the vehicle, substantially as described.

REMARKS

Further consideration of Claim 1 and Claim 2, former Claim 3, is requested. Neither Hutchinson nor the French patent of record discloses means actuated by

changes in speed of a vehicle for operating pumping mechanism. In Hutchinson's device, the pumping mechanism is operated by the lateral movements of the vehicle when the same is in motion, while the apparatus shown in the French patent is especially described as adapted for raising water to a distributing reservoir located at a high elevation. While it is true that the specification of the French patent suggests that the apparatus may be used for compressing air or other fluids, as well as for the particular purpose described, its operation is entirely different from that of applicant's device. The lever F of the French patent is adapted to be operated by hand or by motor, the action of the lever being augmented by the weight on the end thereof after the lever has been raised either by hand or some other motive force applied thereto. By the arrangement and combinations of parts described in the claims, which are not disclosed in any of the references, applicant accomplishes a new result, and it is therefore believed that he is entitled to the claims as drawn. For the same reasons Claim 3, former Claim 4, and new Claims 4, 5, 6 and 7 are also believed to be allowable. None of the references shows the combination of a vehicle frame, of a tank suspended therefrom, cylinders and suspended from the tank in alignment with each other, and means affording one-way passages between said cylinders and tank, as set forth in Claim 3. Claims 4, 5 and 7 further differentiate from the references in describing a cylinder or cylinders arranged longitudinally of a vehicle, an inertia member or pendulum for operating

the plunger or plungers in the cylinder or cylinders, and a member or pendulum movable in the line of movement of the vehicle. Claim 3, as amended, and Claims 5, 6 and 7 also bring out the fact that the inertia member or pendulum has a slot and pin connection with the piston rod of the pumping apparatus. The French patent is an improper reference for claims containing this limitation, as the disclosure of the connection between rods E and F in this patent is very indefinite; in fact, as shown, it appears that rod F is pivoted to rod E in which case the device would be inoperative as it would be impossible to oscillate rod F as described.

For the above reasons, allowance of the claims as now presented is requested.

Respectfully submitted,

WILLIAM L. EDISON

By Frank L. Dyer

His Attorney

Orange, New Jersey

April /7 , 1912.

Div. 9 Room 142

Address only
"The Commissioner of Patents,
Washington, D. C."

2-200

Paper No. 8 JID.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR

P.S. UNITED STATES PATENT OFFICE

WASHINGTON May 15, 1912.

William L. Edisch

Care, Frank I. Dyer,

Orange, N.J.

Please find below a communication from the EXAMINER in charge of your application.

for Air Pumps, filed Nov. 5, 1909, Ser.No.526,428.



E. B. Mottel

Commissioner of Patents.

This application has been considered as amended April 18, 1912.

Claims 1, 2, 3, 5, and 6 are rejected as involving no invention over Hutchinson in view of the French patent, both of record, and the patent to Wendell, of record, which shows a pin and yoke connection.

Claim 4 is rejected as involving no invention over the French patent.

Claim 7 is rejected as involving no invention over ~~the French patent~~ Hutchinson in view of the French patent, Wendell, of record, and Banning, #844,648, Feb. 19, 1907, Air & Gas Pumps, Valves and Valve Gear (A a).

IN THE UNITED STATES PATENT OFFICE

William L. Edison)
AIR PUMPS)
Filed November 5, 1909.) Room No. 142.
Serial No. 526,428)

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office action of
May 15, 1912, please amend the above entitled case as
follows:-

Page 3, line 27, cancel "This" and insert - To
this - . Line 28, cancel "portion 24" and insert in place
thereof - member is secured a member 24 which - .

Claim 1, line 2, cancel "apparatus" and insert -
mechanism - .

Claim 2, line 1, cancel "In pumping apparatus for
a vehicle" and insert - In apparatus of the class described
Line 2, before "or" insert - with a vehicle - .

R E M A R K S

Applicant's invention comprises broadly the com-
bination of a vehicle, pumping mechanism, and means for op-
erating the pumping mechanism so arranged relatively to the
vehicle as to be actuated by changes in speed of the vehicle
to operate the pumping mechanism. It is certainly true
that none of the references of record discloses such a com-
bination in which the pumping mechanism is operated by

changes in speed of the vehicle. It has been repeatedly held that if a combination produces a new and useful result though all the parts of the combination were well known and in common use before the combination was made, that such a combination is patentable. The Examiner's attention is directed to the following extracts from decisions bearing on this point:-

"A new arrangement of old elements may constitute a patentable combination if such arrangement attains new and useful results." (Parsons et al. vs. Minn. Threshing Machine Co., 106 F. 941 - Minn.)

"A new combination with a new mode of operation may be invention even if all the parts are old and even if the function of the combination is also old." (Eagle Wagon Works vs. Columbia Wagon Company, 181 F. 148).

"A new combination of old elements by which a new and useful result is produced * * * * * may be protected by patent as securely as a new machine." (National Hollow Brake Beam Co. vs. Interchangeable Brake Beam Co., 106 F. 693; 45 C. C. A. 544).

"A new organization of old elements which produces a new mode of operation and a beneficial result may involve invention." (Dowagiac Mfg. Co. vs. Minn. Moline Plough Co. et al., 118 F. 136).

The Examiner's attention is also directed to the paragraph preceding Section 38 on page 40 of Walker on Patents, and Sections 153-156 (with foot notes) Vol. 1 of Robinson on Patents, where the question as to what constitutes a patentable combination is discussed at length.

The new and useful result obtained by the new combination and arrangement of parts as defined in applicant's claims is the operation of the pumping mechanism by changes

in speed of the vehicle, and it is submitted that unless the Examiner is able to find references showing a combination for producing this result, applicant is entitled to the protection afforded by the claims presented.

Further consideration and allowance of the claims are accordingly requested.

Respectfully submitted,

WILLIAM L. EDISON

By

Frank L. Ryan

His Attorney

Orange, New Jersey

May 7th, 1913.

WAH-JES

Div.-9..... Room-142

Address only

"The Commissioner of Patents,
Washington, D. C."

2-260

Paper No. 10..... JLD.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR

P.B.

UNITED STATES PATENT OFFICE

WASHINGTON

June 11, 1913.

Frank L. Dyer,

Orange, N.J.



Please find below a communication from the EXAMINER in charge of the application of

William L. Edison, for Air Pumps, filed Nov. 5, 1909, Ser.No.526428.

c 6-2231

E. B. Moore

Commissioner of Patents.

This application has been considered as amended May 8, 1913.

The previous Office action upon the claims is repeated, and this rejection is made final. The pump structure stated in the claims is considered to be inadequately shown in the art cited, and the only distinction over the art is as to the mounting of the pump ^{as indicated} horizontally of the car rather than transversely, as is done in Hutehinson. To mount the pump so that the pendulum will be actuated by the variations in speed of the car, that is, longitudinal-ly of the car, is held not to amount to invention.

[FROM WILLIAM ABBOTT HARDY]

July 23, 1913.

Mr. William L. Edison,
Sussex Avenue,
Morristown, New Jersey.

Dear Sir:

Referring to your patent application, Serial No. 526,428, filed November 5, 1909 and entitled Air Pumps, I beg to inform you that the Patent Office believes there is nothing patentable disclosed in this application.

I enclose herewith photographic print of the patent drawing and copies of the references cited.

In the last Office action, dated June 11, 1913, the Examiner finally rejected all the claims and stated that the only distinction disclosed over the art is the mounting of the pump longitudinally of the car rather than transversely, as is done in Hutchinson. He also stated that to mount the pump longitudinally of the car so that the pendulum will be actuated by the variations in speed of the car does not amount to invention.

The only course open to you is to take an appeal from the action of the Examiner to the Examiners-in-Chief for which a Government fee of \$10.00 is charged. I doubt if such an appeal would be successful, for the following reasons:

Mr. William L. Edison -2-

July 23, 1913.

The French patent discloses a pump construction very similar to yours, while both Hutchinson and Coates disclose pendulum operated pumps, the pump of Hutchinson being so arranged on a car as to be operated by the lateral or swaying motion of the car, and the pump of Coates being so arranged on a ship as to be actuated by the end rocking thereof.

Will you at your earliest convenience kindly advise whether you wish an appeal to be taken or the application to be dropped, and also return the enclosed print and references.

Very truly yours,

WAH-ZCK

Folio No. 552

Serial No. 528,323

Applicant.

Thos. A. Edison

Address.

Orange N.J.

Title Phonograph Reproducers

Filed November 16, 1909

Examiner's Room No. 379

Assignee

Ass't Exec.

Recorded

Liber

Page

Patent No.

Issued

ACTIONS.

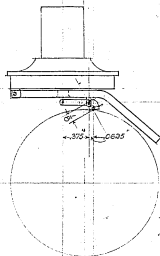
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2 Amended Nov. 26, 1910 17 Set. Nov. 27/11.
3 Finally rejected Nov. 16, 1910 18
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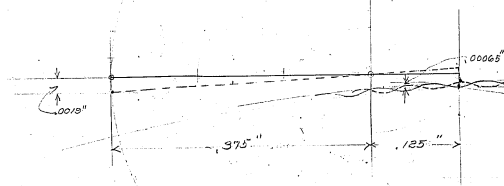
FRANK L. DYER,

Counsel,

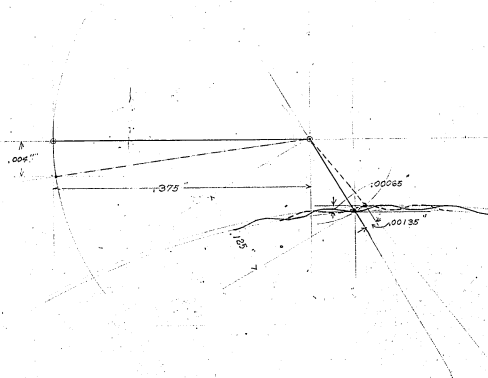
ORANGE, NEW JERSEY.

See closed file
Nov 5 1909
Dyer Smith
by Mr. E. E. E. E.





Disclosed to
Nov 5 1909
Dyer Smith



Nov. 15, 1909

Hon. Commissioner of Patents,
Washington, D. C.

S i r :

Enclosed please find check for \$15.00, filing fee,
together with specification and one sheet of drawings in the
application of Thomas X. Edison, PHONOGRAPH REPRODUCERS.

Kindly acknowledge receipt and oblige

Yours respectfully,

General Counsel.

JMC/JS

Encls.

Petition.

To the Commissioner of Patents:

Our Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, West Orange, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

PHONOGRAPH REPRODUCERS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration No. 560), of Orange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thos. A. Edison

S P E C I F I C A T I O N

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, West Orange, in the County of Essex and State of New Jersey, have invented certain new and useful improvements in PHONOGRAPH REPRODUCERS, of which the following is a description:

My invention relates to phonograph reproducers, and the object thereof is to mount the reproducing stylus in such a manner that the movement of the stylus in following the undulations of the record groove shall cause the movement of that end of the stylus lever which is connected to the diaphragm through a greater arc than is usual in the present practice and the amplification of the sound reproduced is accordingly increased. This is accomplished not by increasing the ratio between the two arms of the stylus lever, but by causing the stylus to swing through a greater arc in following the sound undulations.

In the usual practice in the sound reproducing art as now practiced, the stylus is so mounted on the stylus lever that in following the vertical undulations of the sound record groove, the stylus swings through an approximately vertical arc about the pivot of the stylus

lever, the length of this arc being but little greater than the depth of the groove. The end of the stylus lever to which the diaphragm is connected moves through an arc whose length is that of the arc through which the stylus moves multiplied by the ratio between the arms of the lever. If, however, the stylus is located below the stylus lever in such a position that a line drawn through the pivot of the lever and the bearing surface of the stylus forms a very sharp angle with the vertical, if the diaphragm be considered as mounted in a horizontal position, the stylus swings through an arc which extends in a direction much more nearly horizontal than vertical, and hence the stylus in traveling through a vertical distance equal to the depth of the record groove swings through an arc much greater than in the first case, and the end of the stylus lever connected to the diaphragm swings through a correspondingly greater arc. I have utilized this principle in the construction of the reproducer embodying my invention.

For a clear understanding of my invention, reference is hereby made to the accompanying drawings forming part of this specification, in which Figure 1 represents a side elevation of a reproducer embodying my invention, parts thereof being shown in section; and Figures 2 and 3 are diagrammatic views illustrating the increased lever movement in my invention over that possible in the case of a stylus having a nearly vertical movement.

Referring to the drawings, I have illustrated a sound box 1 provided with a diaphragm 2 which is secured therein between gaskets by means of the threaded ring 3

as is common. The usual floating weight 4 is pivoted at 5 to the block 6, which is supported from the sound box body 1 by means of the screw 7. The stylus lever 8 is pivotally connected to floating weight 4 by means of pivot pin 2 which is carried by lugs 10 depending from floating weight 4, or lever 8 may be pivotally supported from floating weight 4 in any usual suitable manner. The tail of lever 8 is connected to diaphragm 2 by the usual link 11.

Stylus lever 8 carries stylus 12 from its lower surface, this stylus being preferably inclined to the record and so positioned with relation to pivot 2 of stylus lever 8 that a line drawn through the center of pivot 2 and the bearing surface of stylus 12 forms a sharp acute angle with the plane drawn through the axis of the record and the bearing surface of stylus 12, or, what is the same thing, a plane drawn through the center of pivot 2 at right angles to diaphragm 2. I have obtained a much louder reproduction when this angle has been made thirty degrees than when the angle is much greater as is the present practice, the ratio between the arms of the lever being the same in each case. In the drawings I have illustrated a form in which this angle is only fifteen degrees, in which case the reproduction is still louder.

Figures 2 and 3 illustrate diagrammatically the gain in the amount of movement of the end of the stylus lever connected to the diaphragm by practicing the principle of my invention. In Figure 3, which illustrates in a somewhat exaggerated manner the movement of the stylus

mounted according to the usual present practice, the line 9-12 represents the line connecting pivot 9 to stylus 12, this line accordingly representing one arm of the lever. The line 9-13 represents the other arm of the lever, the point 13 representing the end of the stylus lever which is connected to the diaphragm. In this case stylus 12 swings about pivot 9 and travels through arc x,x as it rises from the bottom to the top of record groove a,b in following the undulations of the record. It will be seen that arc x,x is nearly vertical and is but slightly longer than the depth of the groove a,b. The point 13 accordingly swings through arc 13,13'. In the case of a stylus mounted according to my invention as indicated in Figure 2, however, the stylus 12 swings through an arc y,y in traveling from the bottom to the top of the same record groove a,b, the arc y,y being considerably longer than the depth of groove a,b and point 13 of the stylus lever swings through an arc 13²,13³, which is correspondingly greater than arc 13,13' in the first case. As will be seen, the respective lever arms are of the same length in both diagrams. As the amplification depends both upon the ratio between the lever arms of the stylus lever and the amount of swing of the stylus in following the record grooves, it will be seen that by practicing my invention the length of the lever arm 9-13 may be considerably shortened if desired, while at the same time an increased amplification is obtained. By thus shortening the lever arm the mass or weight and consequently the momentum of the moving parts is decreased, whereby a more perfect reproduction is attained. It will also be seen

that in this construction the friction of the stylus upon the record helps to turn the lever about its pivot, since the friction is tangential to the record, and accordingly, a considerable component of this frictional force acts at right angles to the lever arm 9-12. Also, by increasing the amplification as I am enabled to do in this invention, delicate overtones are brought out in the reproduction, which have been lost with the amount of amplification obtained under the present practice.

Having now described my invention, what I claim and desire to protect by Letters Patent is as follows:

1. In a phonograph reproducer, in combination, vibratory means, a stylus lever, connections between one end of the same and said means, a fulcrum for said lever intermediate its ends, and a stylus carried by said lever in such position relative to said fulcrum that it moves through an arc considerably greater than the depth of the record groove in following the undulations of the groove, substantially as described.

2. In a phonograph reproducer, in combination, vibratory means, a stylus lever approximately parallel thereto, connections between one end of the same and said means, a fulcrum for said lever intermediate its ends, and a stylus carried by said lever in such a position relative to said fulcrum that a line drawn through the center of said fulcrum and the bearing surface of said stylus forms a very sharp angle with a plane including said stylus bearing surface and the axis of the record, substantially as described.

3. In a phonograph reproducer, in combination, vibratory means, a stylus lever, connections between one end of the same and said means, a floating weight, a fulcrum for said lever intermediate its ends carried by said weight, and a stylus extending from the lower surface of said lever, the stylus being so positioned relative to said fulcrum that a line drawn through the center of said fulcrum and the bearing surface of said stylus forms an angle of less than fifty degrees with a plane including said stylus bearing surface and the axis of the record, substantially as described.

4. In phonographic devices, the combination of a record having vertical undulations, vibratory means, a stylus lever pivoted intermediate its ends to oscillate in a vertical plane, connections between said vibratory means and one end of said lever, and a stylus carried by said lever and adapted to follow the undulations of the record, said stylus being so positioned relative to the fulcrum of said lever that as it travels over the bottom of the record groove the latter causes it to swing through an arc considerably greater than the depth of the groove, substantially as described.

This specification signed and witnessed this 9th day of November 1909.

Thomas Edison

Witnesses:

1. Oyer Smith
2. Frank L. Oyer

Oath.

State of New Jersey }
County of Essex } ss.,

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, West Orange, New Jersey

that he verily believes himself to be the original, first and sole inventor of the improvements in

PHONOGRAPH REPRODUCERS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Thomas A. Edison

Sworn to and subscribed before me this 9th day of Nov 1909.

Anna R. Klehm

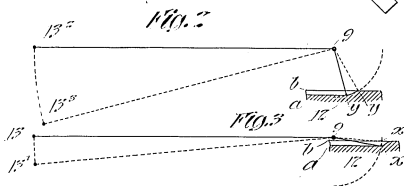
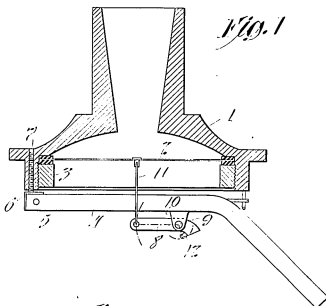
Notary Public.

(Seal)

NOTARY PUBLIC, STATE OF NEW JERSEY.
COMMISSION EXPIRES, JUNE, 1913.

552

5283230



Witnesses:

Frank H. Lewis
Dyer Smith

Inventor:

Thomas A. Edison
By James H. Brown
Att'y.

552

2-200.

Div. 23. Room 379
ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

Paper No. 2-731
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

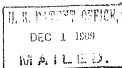
J. H. D. -S.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

December 1, 1909.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.



Care Edison Laboratory.

Please find below a communication from the EXAMINER in charge of your application,

for Phonograph Reproducers, filed Nov. 16, 1909, serial number
528,323.

E. B. Moore

Commissioner of Patents.

This application has been duly examined.

All of the claims are rejected upon the art as
disclosed in,

Georgi, Oct. 5, 1909, #936,115;
Chisholm, March 10, 1908, #881,547;
Macdonald, March 28, 1906, #765,746, (Figure 1);
Le Ferré, March 22, 1904, #755,506, or
Edison, July 1, 1902, #703,774, all in (181-10).

In all of these references the angle defined in the
claim is clearly met in the disclosures cited.

Claim 4 is also objected to because there is no
patentable combination between the record and the reproducer as
now set forth in this claim.

*Carried
forward*

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
PHONOGRAPH REPRODUCERS,) Room No. 379.
Filed November 16, 1909,)
Serial No. 528,323.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of December 1, 1909, reconsideration and allowance of the claims are requested as none of the references disclose the structure described in the claims with sufficient clearness to constitute an anticipation thereof. While the references of record show the reproducing stylus and the pivot of the stylus lever in the relative position, with respect to the record surface described by the claims, this disclosure is evidently merely accidental. None of the references describes this relation and none of them contains any hint of the operation and advantages set forth by the applicant.

Attention is directed to the following quotation taken from page 459, Vol. 1, (Book 1, Chapter III) of Robinson on Patents:

"The rules which govern the sufficiency of the description in the prior patent are the same as in regard to other forms of publication. It must place the invention in the possession of the public as fully as an

examination of the practically operative art or instrument could do. It must describe every essential element of the invention so clearly and completely that any person skilled in the art could construct and use it from the directions given in the Patent, without experimenting or using his inventive powers."

For these reasons it is respectfully submitted that unless the Examiner can cite a reference which clearly describes the structure specified in the claims, the latter should be allowed.

Respectfully,

THOMAS A. EDISON
By

Orange, New Jersey,
November 26, 1910.

His Attorney.

Div 25 Room 349

2-260

Paper No. 4-51, Rej

Address only
"The Commissioner of Patents,
Washington, D. C."

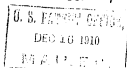
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

J. H. D. - S.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

Dec. 16, 1910.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application.

for Phonograph Reproducers, filed Nov. 16, 1909, serial number
528,323.

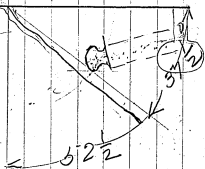
E. B. Moore

Commissioner of Patents.

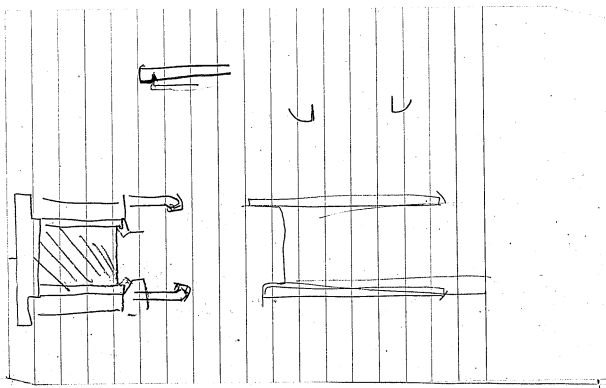
This action is responsive to the argument filed Nov.
29, 1910.

After careful consideration, nothing of patentable
subject matter can be found in applicant's claims and all of the
claims are finally rejected upon the references and for the
reasons of record and the prosecution of this case is closed
except in accordance with the provisions of Rule 68.

Male C



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Nov. 28, 1911.

Mr. Dyer:

Mason applications, Folios 552 and 570, have been finally rejected by the primary Examiner; and the question is whether or not an appeal should be taken from the rejections.

Folio 552 covers a reproducer in which the stylus is so positioned as to increase the amplification of the sound waves by the stylus lever. This increased amplification is obtained by so positioning the stylus in the stylus lever that a line drawn through the bearing surface thereof and the fulcrum of the said lever forms a very sharp angle with a plane, including said stylus bearing surface and the axis of the record, this angle in the construction shown in Figs. 1 and 2 being approximately 15° . Figs 2 and 3 illustrate diagrammatically the increased lever movement of Mr. Mason's structure over that of the commonly employed stylus mounting.

A number of references of record disclose the identical stylus mounting set forth in this application, (see, for example, U. S. patents 785,746 and 936,115 herewith); and I, therefore, recommend that the same be dropped.

Referring to Folio 170, the claims contained therein are as follows:

1. The method of recording sounds phonographically, which consists in vibrating a diaphragm in accordance with sound waves to cut a record of varying depth in the recording surface, and in opposing to the movements of the dia-

Nov. 28, 1911.

phragm away from the recording surface a resistance which increases rapidly with the amplitude with acceleration throughout the whole of each such movement of considerable amplitude, substantially as set forth.

2. The method of recording sounds phonographically, which consists in vibrating a diaphragm in accordance with sound waves to cut a record of varying depth on the recording surface, whereby a resistance, increasing with the amplitude, with acceleration throughout the whole of each such movement of considerable amplitude will be imposed on the diaphragm in its movements towards the recording surface, and in causing the diaphragm, in its movements away from the recording surface, to develop friction increasing with the amplitude, whereby a resistance corresponding to that opposing the movements of the diaphragm in the opposite direction will be imposed on the diaphragm in such movements, substantially as set forth.

Both of these claims have been finally rejected.

The position of the Examiner is stated in the following quotation from the official action of November 18, 1908:

" The Examiner cannot see that the claims remaining in this case express anything more than the function or operation of the devices referred to in such claims, and the claims must be rejected accordingly. It seems if there must be patentable matter, that it must reside in the apparatus by which the alleged method is performed and not in the mere function or operation of the structure."

Nov. 28, 1911.

In considering the rejection of the Examiner, I wish to direct your attention to the following claims taken from U. S. Patent No. 950,226, which patent covers the apparatus embodying the process set forth in this application.

" 1. A phonographic sound recording apparatus, comprising in combination a diaphragm, a stylus connected therewith, and means for imposing a resistance to the movements of the diaphragm away from the recording surface, said resistance increasing with the amplitude with acceleration throughout the whole of each of such movement of considerable amplitude, substantially as set forth.

3. A phonographic sound recording apparatus, comprising in combination a diaphragm, a recording stylus connected therewith, and means for causing the diaphragm in its movement away from the recording surface to develop friction and thereby retard the same, such retardation increasing with the amplitude, with acceleration throughout the whole of each of such movement with considerable amplitude, substantially as set forth.

You will note that the statements in these claims describing the function of the resisting or retarding means are almost identical with the alleged new steps in the rejected claims, and that no additional protection would be afforded us by the allowance of the claims in this application.

Whether or not the rejected claims cover patentable processes, ~~it~~ seems to me very doubtful, especially in view of the claims quoted above from Mr. Wilson's patent covering

Nov. 28, 1911.

the apparatus embodying the invention in question. An argument might be made that the alleged process involves the action of sound waves upon mechanical bodies; for instance, diaphragms, and that this action is so complex, and the waves themselves so variable as regards amplitude, frequency of vibration and quality, that the recording thereof can hardly be considered a problem of mechanics, but rather one involving the molecular properties of the diaphragm and its support. Or, it might be argued that the resistance against the movement of the diaphragm away from the record surface might be imposed independently of mechanism. Personally, however, I think that neither of these arguments would appeal to the present Board of Examiners-in-Chief. In view, therefore, of the breadth of the apparatus claims and the doubt as to whether the rejected claims cover patentable processes, I recommend that this application be dropped.

I have discussed this case with Mr. Holden, and he, too, thinks it should be dropped.

FB-KGK

Folio No. 560

Serial No. 522,075

Applicant.

Thos. A. Edison

Address.

Orange, N. J.

Title Method and Means for Reproducing Sound

Filed Dec. 8, 1909 Examiner's Room No. 379

Assignee Thomas A. Edison, Inc.

Ass'g't Exec. Feb. 6, 1913 Recorded Feb. 8, 1913 Liber 90 Page 445

Patent No. 1,051,517 Issued March 18, 1913

ACTIONS.

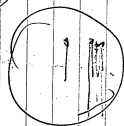
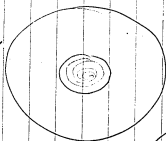
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2	<u>Letter to effect Dec. 15, 1910</u>	17	
3	<u>Office action Jan. 21, 1911</u>	18	
4	<u>Amended Dec. 22, 1911</u>	19	
5	<u>Granted Jan. 29, 1912</u>	20	
6	<u>Amended Dec. 30, 1912</u>	21	
7	<u>Allowed Feb. 1, 1913</u>	22	
8	<u>Final fee due Aug. 1, 1913</u>	23	
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FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Phloxis, Luventis

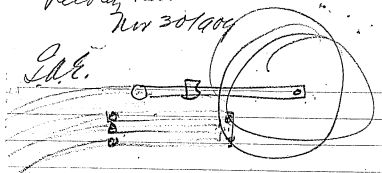


101560

Reproduction for disc record Ready, J. W. Lewis
Mar 26 1909

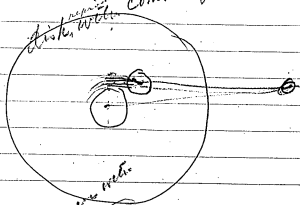
Reedley Lewis
Nov 30/1909

L.H.E.

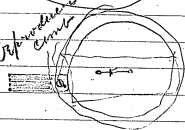


Comb in front

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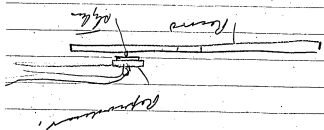
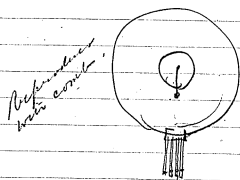


Reproduction of
comb



Redley Lewis
NW 30/1009

J.H.L.



Folio No. 561

Serial No. 532,074

Applicant.

Thos. A. Edison

Address.

Orange, N.J.

Title *Sound Reproducing Apparatus*

Filed *Dec. 8, 1909.*

Examiner's Room No. 379

Assignee.

Ass'g't Exec.

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Page

Patent No.

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1	<i>Rejected Jan. 8, 1910.</i>	16
2	<i>Amended Dec. 15, 1910.</i>	17
3	<i>Rejected Jan. 21, 1911.</i>	18
4	<i>Amended Jan. 4, 1912.</i>	19
5	<i>Rejected Feb. 9, 1912.</i>	20
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VAULT

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

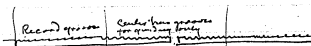
561

William
Roth, Lewis
Dec 2 1909

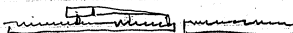
Patent,

①

Look up sec. of Extra groove
in disk for guiding -

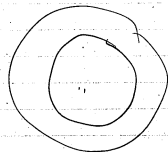
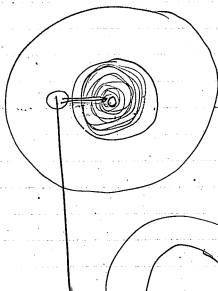


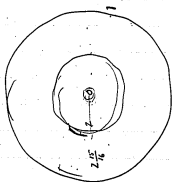
if need - patent this



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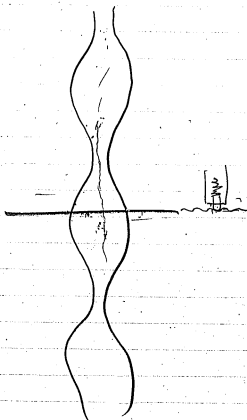
②





43) 09 (91.8

③



④



561

Petition.

To the Commissioner of Patents:

Our Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, West Orange, New Jersey

prays that letters patent may be granted to him for the improvements in

SOUND REPRODUCING APPARATUS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration No. 560), of Orange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thomas A. Edison

S P E C I F I C A T I O N

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, West Orange, in the County of Essex and State of New Jersey, have invented certain new and useful improvements in SOUND REPRODUCING APPARATUS, of which the following is a description:

My invention relates to means for reproducing sound from a record of the same upon a traveling tablet, and also to improvements in disc records adapted to be used in connection with my improved reproducing apparatus. The object of my invention is to provide a novel form of sound record and a novel form of reproducing apparatus which is propelled along the record in accordance with which the reproducing stylus is vibrated by the co-action of a feeding device integral with or connected to the sound box with a groove or track formed on the record surface parallel to the sound groove. Other objects of my invention will appear in the following specification and appended claims.

My invention is particularly adapted to the feeding of a sound box carrying a diaphragm or other vibratory means and the reproducing stylus for vibrating the latter across the spiral grooves of a disc sound record,

although it may be adapted to correspondingly feed the same parts transversely of the record grooves formed on the surface of a revolving cylinder. Also, my invention is particularly applicable for use in connection with the reproduction from a sound record, the sound undulations of which are of the vertical or "hill and valley" type, although it may also be used in connection with a record having lateral undulations.

It has not been feasible heretofore to propel the stylus along the spiral track of a record having vertical undulations formed upon a disc or other record surface ~~if~~ without the use of a mechanical feed device of some nature. It is common in the case of disc records having lateral undulations to vibrate the stylus by and in accordance with the undulations and to propel the stylus along the record solely by means of the engagement of the stylus itself with the record groove. In the case of a record having vertical undulations, however, the walls of the record groove are so sloping that it is extremely difficult to keep the stylus within the groove while feeding the stylus by engagement with the walls of the groove. I overcome these difficulties and obviate the necessity for using an independent mechanical feed by forming a spiral feeding groove having no sound undulations impressed upon the same upon the surface of the record and parallel to the spiral grooves of the record. I provide the sound box with an arm carrying a spring pressed pin having a bearing surface which engages within the feeding groove, while the reproducing stylus engages within the record groove. When the disc or other record

is rotated, the sound box is fed across the record by the engagement of the feeding device with the feeding groove as described.

Referring to the accompanying drawings, illustrating one embodiment of my invention, Figure 1 represents a partial plan view of the same; and Figure 2 a corresponding side elevation.

Referring to the drawings, the sound box 1 is carried by the tone arm 2 which is pivoted in the well known manner as shown at 3. Preferably, the stylus 4 is carried by stylus lever 5, which is pivotally connected in any well known manner to the floating weight 6, the tail of stylus lever 5 being connected to the diaphragm or other vibratory means carried by the sound box, all of these parts being well known. Sound box 1 has an arm 7 formed thereon parallel to the surface of the record 8, and having a pin 9 carried in any suitable manner and extending downwardly from the end of the arm. Record 8 has sound grooves 10 formed thereon in a spiral and feeding or non-record-bearing grooves 11 also formed thereon and parallel thereto as shown in the drawings. As illustrated in the drawings, the sound record grooves are formed on the outer portion of the disc, and the feed grooves 11 between the sound record grooves and the center of the disc. Feeding needle 2 is so placed that when stylus 4 is engaged within one of the grooves of the sound record, feeding stylus 2 engages one of the grooves 11. Feeding stylus 2 and reproducing stylus 4 are lo-

ated at approximately the same distance from the pivotal point 3 about which tone arm 2 swings, so that they both travel along the same arc 12 described about pivot 3 as a center. Preferably, feeding stylus 2 is mounted within a hollow boss 13 extending downwardly from the end of arm 7. Needle 2 is mounted within this boss 13, and has a flange 14 formed thereon sliding within the boss. A spiral spring 15 is mounted within the boss between flange 14, and the sleeve 16 which is mounted in the upper end of boss 13 and through which needle 2 extends. Sleeve 16 may be screw threaded within the upper end of boss 13 and provided with knurled head 17 for adjusting the tension of spring 15. It is, however, obvious that feeding stylus 2 might be mounted upon the end of arm 7 in any other convenient way to be spring pressed toward the surface of the record, as by means of a leaf spring. The spiral grooves 10 and 11 are shown as formed to feed the sound box outwardly from the center, but it is obvious that if desired they might be formed to feed the sound box from the outside of the record toward the center.

Having now described my invention, what I claim and desire to protect by Letters Patent is as follows:

~~Excluded which~~
1. In sound reproducing apparatus, the combination of a traveling surface having a sound record formed thereon in a spiral groove and having a parallel spiral feeding groove, vibratory means free to be moved across the record surface and vibrated in accordance with the sound undulations of the record, and feeding means engaging within

the feeding groove and connected to propel the vibratory means in accordance with the contour of the feeding groove, substantially as described.

12. In sound reproducing apparatus, the combination of a traveling surface having a sound record formed thereon in a spiral groove and a parallel spiral feeding groove, a reproducing stylus shaped for engagement with said record groove, vibratory means and connections between the same and said stylus, a sound box carrying said vibratory means, and free to be moved across the record surface, and a spring pressed pin shaped for engagement with said feeding groove and connected to propel said sound box in accordance with the contour of the feeding groove, substantially as described.

13. As a new article of manufacture, a disc sound record formed of suitable material and having a record groove formed spirally on the surface thereof and a feeding groove also formed in a parallel spiral on the surface thereof, substantially as described.

14. As a new article of manufacture, a disc sound record formed of suitable material and having a record groove formed spirally on the surface thereof and a feeding groove also formed in a parallel spiral on the surface thereof nearer the center of the disc than the said record groove, substantially as described.

This specification signed and witnessed this 14th day of Dec 1909.

Thos. A. Edison

Witnesses:

1. Eyer Smith

2. John M. Caufield

Oath.

State of New Jersey }
County of Essex ss.,

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, West Orange, County of Essex, State of New Jersey

that he verily believes himself to be the original, first and sole inventor of the improvements in

SOUND REPRODUCING APPARATUS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 14th day of Dec 1909.

Anna K. Klehm

Notary Public.

NOTARY PUBLIC, STATE OF NEW JERSEY
COMMISSION EXPIRES, JUNE, 1913.

561

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Fig. 1

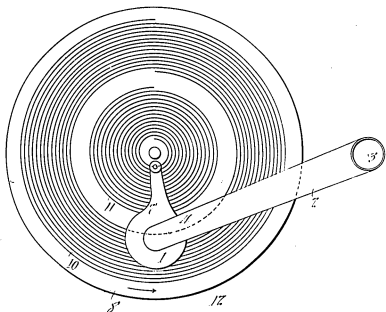
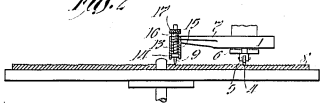


Fig. 2



Witnesses:
 Frank D. Lewis
 Dyer Smith

Inventor:
 Thomas H. Coleman
 His Atty.

561

Div. 23 Room 379

ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

J.H.D.-S.

2-280.

Paper No. 2,167.

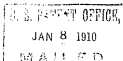
All communications regarding this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

WASHINGTON, D. C.,

January 8, 1910.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.

Please find below a communication from the EXAMINER in charge of your application.

for Sound Reproducing Apparatus, filed Dec. 8, 1909, serial number
532,074.

E. B. Moore,

Commissioner of Patents.

This application has been duly examined.

Claims 1 and 2 specify sound reproducing apparatus,

Claims 3 and 4 specify a record tablet.

As a distinction is acknowledged in the manufacture,
invention and sale of these articles, division is required
according to the provisions of Rule 42.

In amending this case, applicant should consult:

Goold, April 9, 1901, #671,513, (181-3);

Clark, May 10, 1904, #759,348, (181-5);

English patent to Edison, April 24, 1878, #1644, and

English patent to Adams-Randall, Jan. 21, 1889, #1,050.

substantive

1.052

Confidential
Smith

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison :
SOUND REPRODUCING APPARATUS : Room No. 379.
Filed December 8, 1909 :
Serial No. 532,074 :

HONORABLE COMMISSIONER OF PATENTS

S I R :

In response to Office action of
January 8, 1910, please amend this case as follows:-

Cancel Claims 1, 3 and 4 and renumber Claim 2
as Claim 1.

Add the following claims:-

2. In sound reproducing apparatus, the combination
of a traveling surface having a sound record formed there-
on in a spiral groove and a parallel spiral feeding groove,
a reproducing stylus shaped for engagement with said
record groove, vibratory means and connections between
the same and said stylus, a sound box carrying said vibra-
tory means, and free to be moved across the record sur-
face, a pin connected with said sound box and shaped for
engagement with said feeding groove, a spring for pressing
said pin into said last named groove, and means for ad-
justing the tension of said spring, substantially as de-
scribed.

662
and connected to pin and moved across record surface
for pressing
into groove
662

3. In sound reproducing apparatus, the combination of a traveling surface having a sound record formed thereon in a spiral groove and a parallel spiral feeding groove, a reproducing stylus shaped for engagement with said record groove, vibratory means and connections between the same and said stylus, a sound box carrying said vibratory means, and free to be moved across the record surface, a pin having an annular flange connected with said sound box and shaped for engagement with said feeding groove, a spiral spring engaging said flange and pressing said pin into said last named groove, and means for adjusting the tension of said spring, substantially as described.

R E M A R K S

The above amendment complies with the requirement for division made in the last Office action. Claim 1 has been canceled and two new claims have been added. These new claims, as well as present Claim 1, include as an element of the combination a spring pressed pin for engagement with the guiding groove. This feature is not shown in any of the patents of record, and it is therefore thought that all the claims now in the case should be allowed.

Respectfully submitted,

THOMAS A. EDISON

By Frank L. Dyer

His Attorney

Orange, New Jersey
December/5, 1910.

Div. 23 Room 379

Address only
"The Commissioner of Patents,
Washington, D. C."

J.H.D.-S.

2-280

Paper No. 100000

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

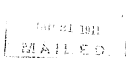
DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

January 21, 1911.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.

Care Edison Laboratory.



Please find below a communication from the EXAMINER in charge of your application.

for Sound Reproducing App., filed Dec. 8, 1909, serial number
532,074.

E. B. Moore

Commissioner of Patents.

This action is responsive to the amendment filed Dec.
16, 1910.

The use of "parallel" in line 3 of each claim, is
objectionable as inaccurate. Two spiral grooves, one within
the other, cannot properly be said to be parallel one to the
other.

All of the claims are rejected upon the references
of record or French patent #368,914, Dec. 21, 1906, (181-5), or
English patent to Von Madaler, Nov. 24, 1899, #23,497, (181-5), *all three had not of prior*
or Austrian patent to Broce, #8995, Sept. 10, 1902, (181-5), in
view of Terrell, March 13, 1906, #815,233, (189, Engraving Machines),
which latter patent shows it to be common to use a spring pressed
follower. See also Konigstein, Nov. 14, 1905, #804,477. The roller
12 will assist in feeding the reproducer. No invention can be
seen in substituting the conventional spring pressed pin, in
place of the fixed pin of the references cited, in view that
spring pressed followers ~~xxx~~ are old in the engraving art. An
adjustable follower is shown in Broce.

*Marks & Clerk,
Consulting Engineers &
Chartered Patent Agents.*

G. GREGORY MARKS, AALICE, MIMM.
DUGALD CLARK, MIMM. FOR
EDWARD C. H. MARKS, AALICE, MIMM.
HAYMIRCH ADAM, C.M., AALICE.

22, 23
18 SOUTHAMPTON BUILDINGS
LONDON, W.C.
BIRMINGHAM: 13 TEMPLE ST.
MANCHESTER: 13 MARKET STREET
ORDERS USED
AT A.B.C. WESTERN UNION
& PRIVATE.

TELEGRAPHIC ADDRESS: "MARKS & CLERK, LONDON."
TELEPHONE: 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

57 & 58 Lincoln's Inn Fields.

London, W.C.

ALL COMMUNICATIONS TO BE
ADDRESSED TO THE FIRM.

IN REPLY REFER TO
BL/92

February 7th 1911.

F.J. Dyer Esq.,

Edison Laboratory,

Orange, N.J., U.S.A.

*see copy of this patent
in vol. 8 of the
patents*

Dear Sir, re New Jersey Patent Co. s/c.

Your letter of the 21st ultimo is to hand, but we
regret to inform you that the British Patent Specification No.
23,497 of 1899 is out of print. To obtain copies a special
reprint will have to be ordered, and we await your instructions
should you wish a reprint obtained.

Yours very truly,

Marks & Clerk

Heard

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
SOUND REPRODUCING)
APPARATUS,) Room No: 379.
Filed December 8, 1909,)
Serial No. 532,074.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of January 21, 1911, please amend the above entitled case as follows:

In line 8, claim 2, cancel "connected with said sound box and", and in line 9, same claim, after "groove" insert - and connected to propel said sound box across said surface in accordance with the contour of said feeding groove - .

In lines 8 and 9, claim 3, cancel "connected with said sound box and" and in line 10, same claim, after "groove" insert - and connected to propel said sound box across said surface in accordance with the contour of said feeding groove - .

R E M A R K S

Referring to the objection of the Examiner to the word "parallel" in line 3 of the claims, it is thought that this word is correctly used. The distance of any point on the feeding groove from the corresponding point on the record groove is constant for the whole length of these grooves. It is this meaning which the applicant wishes to convey by the use of the word "parallel".

The claims have been rejected on the ground that "No invention can be seen in substituting the conventional spring pressed pin, in place of the fixed pin of the references cited, in view that spring pressed followers are old in the engraving art", the patent to Terrell being cited from the engraving art to show a spring pressed pin. This patent relates to a distinct art from that of the applicant's device, and there is no suggestion in any of the references of the substitution of such a spring pressed pin for the fixed pin disclosed in the phonograph references of record. The employment of a fixed following pin is objectionable because the commonly found unevenness of the record surface, that is the departure thereof from a true plane or cylinder renders impossible the accurate tracing of the feeding and record grooves by the feeding pin and the sound box stylus when such a pin is used. In applicant's structure, this defect is overcome by the employment of a spring pressed pin; and applicant has thereby produced a more efficiently operating device than those shown in the references.

Furthermore, even the substitution of the spring pressed pin of Terrell for the fixed pin shown in the other references would not produce the structure set forth in claims 2 and 3. Both of these claims specify means for adjusting the tension of the spring. No such means is shown by the references; and in Terrell's device the tension of the spring varies by a large amount as the follower moves towards or away from the centre of the pattern. Claim 3 furthermore differentiates from the references by specifying "a pin having an annular flange".

Applicant's structure as claimed is clearly not suggested by the references and possesses advantages not possessed by the structures shown by the latter. For this

reason, it is believed that the claims are patentable and should be allowed.

Reconsideration and allowance are accordingly respectfully requested.

Orange, New Jersey,
January 4, 1912.

Respectfully submitted,

THOMAS A. EDISON,

By

Franc L. Dyer
his Attorney.

Div. 23. Room 370

2-200

Address only
"The Commissioner of Patents,
Washington, D. C."

Paper No. 112

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

J.H.D.-S.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

Feb. 9, 1912.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.

U. S. PATENT OFFICE,
FEB 9 1912
MAILED.

Please find below a communication from the EXAMINER in charge of your application.

For Sound Reproducing Apparatus, filed Dec. 8, 1909, serial number
532,074.

E. B. Moore

Commissioner of Patents.

This action is responsive to the amendment filed Jan. 5, 1912.

Claim 1 is rejected upon the references of record or
Macdonald, Nov. 14, 1911, #1,608,595, or French patent to Wilken,
at al., #475,133, Nov. 6, 1908, (161-5), or German patent #166,536,
(161-5). It is noted that Adams Randall was wrongly cited in the
first office action. The correct number is #1056 of 1889.

Invention is not found in applying any spring pressed tracing pin
to the references cited such as is shown in Terrell of record or
Diss, June 8, 1909, #934,539, (159-Pantographic), in place of the
tracing pins employed, especially in view that Gould of record
shows a pin that will yield to irregularities and that Macdonald
shows the pin spring pressed into engagement. It is not seen
that any new function is given the spring pressed pin in
the talking machine structure other than what it has in the
engraving machine structure.

Claim 2 is rejected upon the references and for the reasons
above given.

Invention is not found in making the pin adjustable in view
that it is old to make the guide pin adjustable as in the referen-

#535,674-----2.

ces of record.

Claim 3 is rejected upon the references and for the reasons above given.

Applicant has only: employed a very common form of spring pressed pin and invention is not found in substituting such in the place of the structure cited, see Konigstein as an example of the type of pin employed by applicant .

Folio No. 587

Serial No. 551,128

Applicant.

Thomas A. Edison

Address.

Orange, N.J.

Title

Chonographs

Filed

March 25, 1910

Examiner's Room No.

379

Assignee

New Jersey Patent Co

Ass'g't Exec Aug. 10, 1914 Recorded Aug. 11, 1914 Liber A-95 Page 350

Patent No. 1,110,428

Issued Sept. 15, 1914

ACTIONS.

- 1 Office letter Apr. 13, 1910 16
- 2 Amended March 22, 1911 17
- 3 Office letter May 2, 1911 18
- 4 Amended April 13, 1912 19
- 5 Office letter May 4, 1912 20
- 6 Amended April 30, 1913 21
- 7 Office letter May 14, 1913 22
- 8 Amended May 9, 1914 23
- 9 Allowed June 5, 1914 24
- 10 Final fee due Dec. 5, 1914 25
- 11 Final fee paid Aug. 15, 1914 26
- 12 27
- 13 28
- 14 29
- 15 30

PAID

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Dyer =

1
R. L. Lewis
Feb 16 1910

The following is way to make the diamond points -

1st We cleave the diamond into flat plates

2nd These flat plates are notched by diamond dust + broken into splints



plate

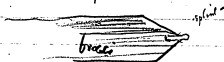


splint

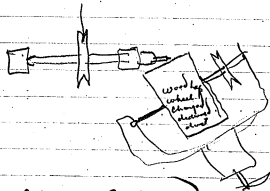
Rec Feb 16 1910
Dyer Smith

2

The splint is secured to a brass holder by cement



Then chucked in lathe

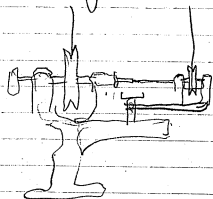


Worked narrow & ground
at angle 30 degrees.

3



The end is blunt rough -
We then put it in the Rag
ball polishing Machine



4 round the end until its
8/1000 -

4

This



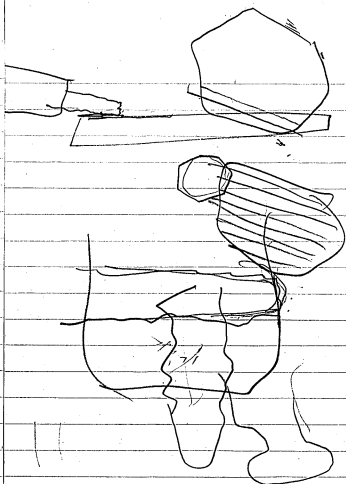
I guess you can work up
an application, that will
at least stop others
from giving us trouble

This method of grinding to
angles & then rounding end
gives great strength & it seems

5-

to be the only practicable
way to make them without
a large amount of grinding
& loss of strength -

Edison



Dyer =

Let me know how the Diamond point looks - I sent you 2 more points by Express -

Making these Diamond points is a great surprise to me - its extremely easy the way we do it. Tomorrow I will send you sketch of just what we use & the exact time of operation -

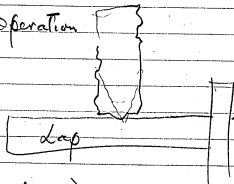
It occurs to me that it might be best to select a reliable man from the Saphires dept & start the Diamond point by at Glen Ridge & start it slowly with girls who could be depended upon in future. There is no doubt girls would do on Diamonds

2

When they might not do on Saphires as cut is slower & not liable to make a mistake -

Let me know what you think of this -

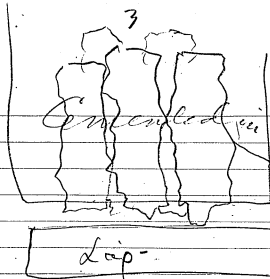
1st Operation



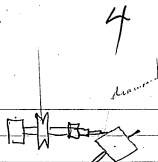
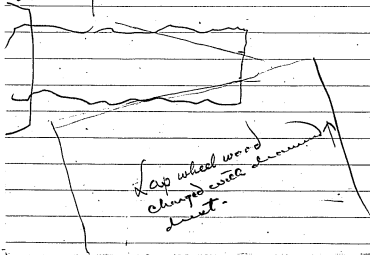
getting flat end on diamond point. a single one requires 15 minutes -

think could be crunched together & dog done at once -

Thus



2nd Operation



This requires 30 minutes to finish
only one machine & person who must
attend continuously - Output
in 10 hours certainly 20 diamonds
20 girls & 20 machines should
give 400 points per day.

The machine is the same as you
now use "Pied" or get it from
the phone works.

The 3rd & last operation is
pulling the rounded end on
8/1000.

5

This requires $1\frac{1}{2}$ to 2 hours + not
 Exceeding this. One person can
 attend any number of machines.
 They act entirely automatic
 only requiring feed of diamonds
 dust now & then & removal
 of brass holder to caliper.
 This machine is your standard
 machine for polishing Saphire
 Gals. - You can count on
 each machine doing 6 per
 day - & they are cheaply made
 if you want 400 points daily
 10 hours you will need
 about 70 of these -

That's all - As the ~~over~~
 Rubbings in Saphire
 dept don't think you

6

Should attempt any diamond
 work there, but at the Ridge

I will send photo of the 2
 machines tomorrow or sketch
 so Weber will see just what
 we use - I am quite sure
 you have enough machines
 of both kinds that you do
 not need to turn out

quite a bunch of points
 daily - I enclose several
 diamond points -

These were obtained from
 Van Moppes 68 Nassau St
 NY - They cost 7 cents each
 When you order some show
 him sample sent you you
 want them like sample which
 he furnished Edison some

7

time ago -

I cannot say how much diamond
dust will be used but if there
is proper devices for saving it
in grinders I cannot see why
these points should cost
more than 35 to 40 cents each

By flattening, angling & ~~flat~~
flaking only 1/3 of the end it
reduces cost enormously -
I sent you ^{this} idea for patent
application - don't forget it

Sketch or photo tomorrow

Σ

P.S. Have you tried the guiding groove
second groove on a disk to be sure
that it works OK -

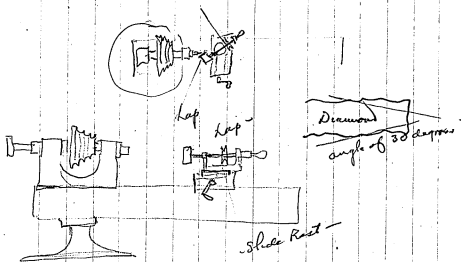
Σ

Dyer

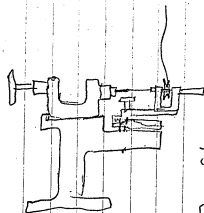
These are the diamond
tooth which I wrote
you about 2 days

ago
Dyer

[illegible]



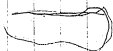
This is the way we ground
angles with — we first flatten
end of point — 2



This is your Reg ball pulser



[ON BACK OF PRECEDING PAGE]



REFER TO THIS NUMBER
IN YOUR REPLY

1146

MEMORANDUM

FRANK L. DYER,
ORANGE, N. J.

Mr. Dyer Smith:

2/26/10.

I return herewith the application on diamond points and you will note a number of memorandums which I have endorsed thereon. My impression is that in rounding the diamond point the stylus ought to partake of a rotary movement so as to prevent the possibility of fine ridges being formed on the curved surface as might happen if the two elements of the grinding device were arranged in line as shown in the drawing. With a material no harder than celluloid, and usually softer than the same, a sapphire stylus partakes of no appreciable wear, but when the material is substantially harder than celluloid a sapphire stylus quickly wears out, hence a diamond is important. Of

(2)

course the amount of weight imposed on the stylus enters into the problem and I think that you should refer in the application to the fact that in order to get good reproductions a weight of from three to five ounces is necessary. When such a weight is used with very hard material, appreciably harder than celluloid, diamond is the only material that can be used for the stylus. I think if you work up the case in artistic fashion a substantial basis will be offered for broad claims. I would criticise the drawings as not properly illustrating the invention, because as a matter of fact the diamond splints under the microscope show very irregular sides, and I think these should be shown in the drawing. Also, in Figures 4 and 5 the relation between the size of the splints and the rest of the apparatus is very much

(3)

out of proportion. Of course it is not necessary in a patent drawing to have substantial proportions, but I do not think they should be so much out of proportion as these drawings show. When it is remembered that the diamond splints themselves are probably not much more than 1/100 of an inch in diameter, the pulleys shown would apparently be about 1/4 inch in diameter. I think the drawings should be made over and be more nearly in the correct proportions.

F.L.D./IWW

F. L. D.

A handwritten signature in dark ink, appearing to be 'F.L.D.' with a stylized flourish.

A Sketch:-
 Raptisgen finds that
 the brass chucks can conveniently
 enclose the entire splint,
 thus

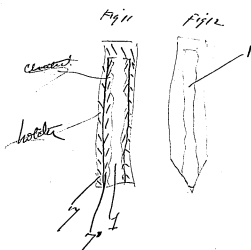


In grinding off the chucks
 no ground areas, like a lead
 pencil - This prevents
 breakage of the splints, which
 are very brittle - Therefore
 this, and reminds me to call
 Edison's attention to it when
 papers are sent off - Also
 claim it - hint a
 new trial point

R. R. R.

[ON BACK OF PRECEDING PAGE]

346
462



Set for
Shannon Quarter
to 7.587.
Set also as spec.
to 7.587.

V

Fig 1



2

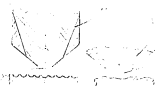


2

Fig 2

3

Fig 3



3

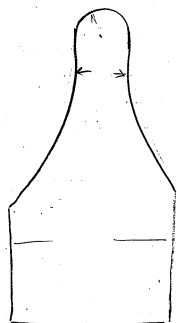
Fig 4



9

10

1 Claim or combination
diamond stylus and record;
Class for diamond
stylus an article of manufacture.



3
74
73
#385



Folio No. 588Serial No. 556,469

Applicant.

Thos. A. Edison

Address.

Orange, N.J.Title Sound Recording ApparatusFiled Apr. 20, 1910.Examiner's Room No. 379.Assignee T. A. Edison IncAss't Exec. Oct. 14, 1910. Recorded Oct. 16, 1911. Liber Vol. 88. Page 162.Patent No. 1019,441Issued Mar. 5, 1912.

ACTIONS.

- | | | | |
|----|---------------------------------|----|-------------------------|
| 1 | Rejection May 16, 1910 | 16 | No sign appears to be |
| 2 | Amended May 9, 1911 | 17 | filed, as per advice of |
| 3 | Office letter June 9, 1911 | 18 | F. L. D. 10/11 |
| 4 | Amended June 19, 1911 | 19 | |
| 5 | Office letter July 2, 1911 | 20 | Paid Feb. 15, 1912 |
| 6 | Amended July 22, 1911 | 21 | Paid Feb. 7, 1912 |
| 7 | Allowed Sept. 19, 1911 | 22 | |
| 8 | Final fee Mar. 19, 1912 | 23 | |
| 9 | " " Paid Feb. 7, 1912 | 24 | |
| 10 | Letter requesting correction in | 25 | |
| 11 | patent. | 26 | |
| 12 | | 27 | |
| 13 | | 28 | |
| 14 | | 29 | |
| 15 | | 30 | |

VAULT

FRANK L. DYER,
Counsel,
ORANGE, NEW JERSEY.

9.588

March 21 1910

Ring Diaphan.

A Fig 1

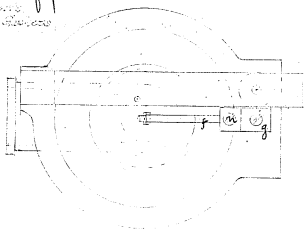
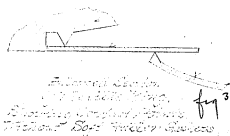
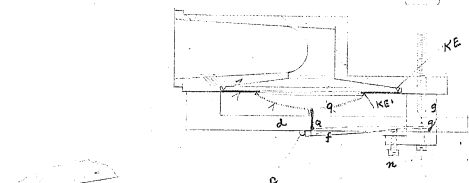
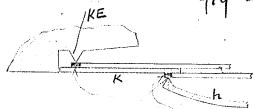


Fig 2



Exterior Enlarging View To Show Details Connected To Main Ring

KE'

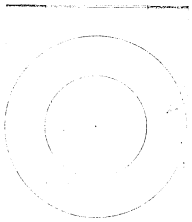
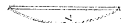


Fig 4



Received
March 25, 1910
James L. Linn
March 26, 1910
Pres. Smith
Recd by Linn
Mar 26, 1910

Folio No. 596

Serial No. 560,484

Applicant.

Address.

Thos. A. Edison

Orange, N.J.

Title Phonograph Stylus

Filed May 12, 1910.

Examiner's Room No. 379.

Assignee Thos. A. Edison, Inc.

Ass't Exec. Aug. 30, 1912

Recorded

Liber

Page

Patent No. 1,041,983

Issued October 22, 1912

ACTIONS.

- 1 Office Letter June 8, 1910. 16
- 2 Amended May 13, 1911. 17
- 3 Office Letter January 1, 1911. 18
- 4 Argument & Affidavit filed 1/1/11. 19
- 5 Allowed Aug. 17, 1912. 20
- 6 Final Fee due Feb. 17, 1913. 21
- 7 22
- 8 23
- 9 24
- 10 25
- 11 26
- 12 27
- 13 28
- 14 29
- 15 30

VAULT

FRANK L. DYER,
Counsel,

ORANGE, NEW JERSEY.

Reidy & Whinn
Apr 28 1910

Me 25 1910

Red marks 1910
Dyer Smith

Dyer =

I think that we should file another
application on reproducing prints
as an insurance. They are making
Boron in the Electric furnace
& this is about 5 times harder
than Saphire, it can be polished
better than diamond & is not so
fragile, it comes in small pieces
but could be ground thus



as Traphagen does it, using a good
current, should future litigation
make it hard for us to use
diamond we can fall back
on this & there is nothing else
know Edison

Folio No. 600

Serial No. 563,041

Applicant.

Thos. A. Edison

Address.

Orange, N.J.

Title

Can or Receptacle.

Filed May 24, 1910.

Examiner's Room No. 175

Assignee

Ass'g't Exec.

Recorded

Liber

Page

~~Patent No.~~

Issued

July 5, 1915

ACTIONS.

- 1 Office letter June 10, 1910. 16
- 2 Amended June 2, 1911. 17
- 3 Office letter June 17, 1911 18
- 4 " " July 5, 1911 19
- 5 Amended May 31, 1912 20
- 6 Rejected June 18, 1912 21
- 7 Amended June 16, 1913 22
- 8 Rejected Aug 22, 1913 23
- 9 Amended July 25, 1914 24
- 10 Final rejection Aug 25, 1914 25
- 11 26
- 12 27
- 13 28
- 14 29
- 15 30

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

600

Petition.

To the Commissioner of Patents:

Our Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, West Orange, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

CAN OR RECEPTACLE

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration No. 560), of Orange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thos A. Edison

S P E C I F I C A T I O N .

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, West Orange, New Jersey, have invented a certain new and useful CAN OR RECEPTACLE, of which the following is a description:

My invention relates to metallic cans or receptacles particularly adapted for containing storage batteries of the iron-nickel type with alkaline electrolyte invented by me. My invention is an improvement upon that disclosed in Letters Patent No. 861,242, granted to me July 23, 1907, and my object is to provide an improved can or receptacle of the character specified, as a new article of manufacture, and to provide a suitable process for manufacturing the same.

The invention disclosed in my patent above referred to comprised a thin-sheet-steel nickel-plated corrugated can, having a welded side seam and top and bottom members also welded in position within the opposite ends of the body of the can. The welded joints referred to overcame the difficulties which had been experienced in the case of joints made with solder, in which the joints sometimes became affected by local electrolytic action between the solder and adjacent metallic surfaces, so that

they were no longer liquid and gas tight. The nickel plating adjacent to the welded joints, however, is injured by the welding process, leaving the steel unprotected, and since the lower surfaces of the cans are apt to be wet, the joint between the body and the bottom, and the lower portion of the side seam of the body, may become oxidized, and therefore leaky, electrolytic action between the lower portions of adjacent cans tending to hasten this oxidation. Therefore, and according to my present invention, I plate an extra coating of nickel upon the welded joint between the bottom and the body and the lower portion of the side seam of the body to protect the same. This can best be done by holding the welded can with its lower portion immersed in a plating bath and plating a suitable coating thereupon. I find this to be the best method by which to make a receptacle of the character described which remains permanently tight under the hard conditions to which it is subjected.

Attention is hereby directed to the accompanying drawings forming part of this specification, illustrating a can or receptacle embodying my invention and made according to my improved process. In the drawings, Figure 1 represents a side elevation of a storage battery can or receptacle shown partly in cross section; and Figure 2 represents an enlarged sectional detail of the welded joint between the can body and bottom protected by an electrolytic metallic deposit.

Referring to the drawings, the body 1 of the can or receptacle is made of a very thin sheet metal, such as steel, carefully nickel-plated. To provide for the necessary stiffness, corrugations 2 may be formed upon the faces of the can. The body 1 is preferably formed with a side seam 3 which is welded and turned down as described

in my patent above referred to. The welding may be accomplished either by means of the flame of an oxy-acetylene burner, or by means of the progression of a rotating carbon, as described in my ^{U.S.} patent No. 847,746, granted March 19, 1907, or by other suitable means.

The top of the can may be flanged and secured within the top of the body 1 by a welded joint as described in my patent No. 861,242 above referred to. The bottom 4 is provided with a down-turned flange 5, and is welded in position within the lower end of the body 1 in the manner described in my patent No. 861,242, the welding being accomplished in the same manner as described in connection with the side seam 3 of body 1, the joint between the flange 5 and the lower end of body 1 being in practice usually welded for only a short distance upward from the lower edge of the joint. When the bottom has been welded in position, the lower end of the can is placed in an electro-plating bath, whereby a metallic deposit 6 preferably of nickel, is formed about the welded joint 7 and upon the lower surface of the bottom 4 and the adjacent exterior surface of body 1. By this means the joint 7 and the lower portion of seam 3 are rendered permanently tight and are protected against oxidation. After the heavy coating described has been deposited upon the lower portion of the can, the whole can may be lowered into the plating bath, and given a light plating all over, or if desired, the can may be given a heavy coating all over, all in one operation.

Having now described my invention, what I claim and desire to protect by Letters Patent is as follows:

Claim 1 rewritten - See Invention A - 6/14/13
1. A metallic can or receptacle comprising a body and a flanged bottom, both formed of plated metal, said bottom being welded to the body along the edge of its flange, and an electrolytic deposit of metal being formed upon the welded joint, substantially as described.

Cancelled 7/25/14
2. A metallic can or receptacle comprising two plated parts, one of which is provided with a flange, a welded joint being formed between the edge of said flange and said other part, and a film of metal plated upon said joint to protect the same, substantially as described.

3. A metallic can or receptacle comprising a body having a welded side seam, and a bottom with a downwardly extending flange within the lower end of said body, both said body and bottom being formed of nickel-plated metal, said bottom being welded to the body along the lower edge of said flange, and a coating of nickel being formed upon said welded joint, the lower portion of said side seam, and the adjacent surfaces of the bottom and body, substantially as described.

Cancelled 6/17/11
4. The process of making a metallic can or receptacle, consisting in forming a body portion of plated metal, inserting a flanged bottom of plated metal within one end of the same, welding the bottom to the body along the lower edge of the bottom flange, placing the lower end of the body portion with the bottom welded thereto in a plating bath, and plating a metallic deposit upon the welded joint between the bottom and the body and upon the ad-

Cancelled 6/1/11
jacent surfaces of the body and the bottom, substantially as described.

5. The process of making a metallic can or receptacle, consisting in forming a body portion of plated metal and welding a side seam therein, inserting a flanged bottom of plated metal within one end of the said body, welding the bottom to the body along the lower edge of the bottom flange, placing the lower end of the body portion with the bottom welded thereto in a plating bath, and plating a metallic deposit upon the welded joint between the bottom and the body, the lower portion of the side seam, and upon the adjacent surfaces of the body and the bottom, substantially as described.

Insert A - Claim 7/25/11

This specification signed and witnessed this 19th day of May 1900.

Thos. A. Edison

Witnesses:

1. Dyer Smith
2. John M. Caulfield

Oath.

State of New Jersey }
County of Essex } ss.,

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Ilewellyn Park, West Orange, Essex County, New Jersey

that he verily believes himself to be the original, first and sole inventor of the improvements in

CAN OR RECEPTACLE

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Thos. A. Edison

Sworn to and subscribed before me this 19th day of May 1900.

(Seal)

ANNA R. KLEHM
NOTARY PUBLIC STATE OF NEW JERSEY
COMMISSION EXPIRES JUNE 1913
Notary Public.

600

563641

234/125

Fig. 1

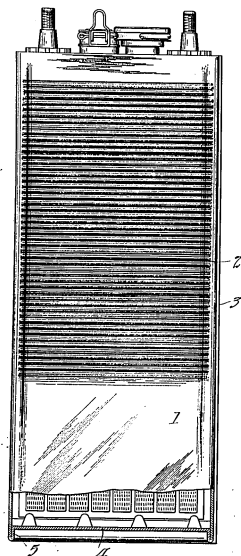
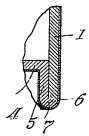


Fig. 2



Witnesses:

Robert M. Dufrenoy
Dyer Smith

Inventor:

Thomas A. Edison
by Frank T. Allen
His Atty.

600
DIV. 3 Room 175

ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

2-280.

Paper No. 2

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

R.A.J.

DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

WASHINGTON, D. C., Jun. 10, 1910.

Thomas A. Edison,

C/o Frank L. Dyer,

Orange, N.J.



Please find below a communication from the EXAMINER in charge of your application,

563,041, filed May 24, 1910:-----

Can or Receptacle.

E. B. Moore

Commissioner of Patents.

The claims in this application cover two separate and distinct inventions and are examinable in different divisions of the Office. Claims 1 to 3 are specific to a metallic can while claims 4 and 5 are drawn to a process for making a can and protecting the welded joint by a metallic deposit. Division will therefore be required between these two sets of claims.

The following references are cited as an aid in amending:---

Edison, ✓ 861,242, Jul. 23, 1907, 220 - 5,
Warner, ✓ 749,763, Jan. 19, 1904, 27 - 16
Wetters, ✓ 901,115, Oct. 13, 1908, 204 - A. R. C. H.

Examiner, Division 3.

*Amended
Wetters*

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)
CAN OR RECEPTACLE)
Filed May 24, 1910)
Serial No. 563,041)

Room No. 175.

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office letter
of June 10, 1910, please amend the above entitled case
as follows:-

Cancel Claims 4 and 5.

R E M A R K S

This amendment is made in compliance with the
requirement of division contained in the Office letter of
June 10, 1910. Applicant reserves the right to file a
divisional application covering the process.

Action on the merits of the claims remaining in
the case is requested.

Respectfully submitted,

THOMAS A. EDISON,

By _____

Orange, New Jersey
June , 1911.

His Attorney

600- Div. 4 Room 280

2-200

IWT

Paper No. 4

Address only
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

June 17, 1911.

Thomas A. Edison,
c/o Frank L. Dyer,
Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

563,041 filed May 24, 1910 for Can or Receptacle.

E. B. MOTT

Commissioner of Patents.

The claims are rejected on either Edison, 861,242 of record
or the patent to

Burke, 3422, (Br.) of 1869, (220-1)
as there is no invention in coating the joint of either of the
patents with an electrolytic deposit of nickel, or the entire
body if desired, in view of Warner of record.. Nickel is well
known as a coating to prevent rusting of a metal body and there is
therefore no invention in applying an electrolytic deposit of this
particular metal.

Examiner.

ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

P-465

LETTER No.

LCE

120715

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

June 23, 1911.

Mr. Frank L. Dyer,
Orange,
New Jersey.

Sir:-

Your twelve coupons dated the 19th instant were received by this office, and ten of the copies of patents desired mailed to you today. The exhausted copy will be reproduced and mailed to you.

The other coupon is returned herewith, as the office is unable to identify the patent desired from the data called for thereon. Patent No. 3,422 was issued on February 2, 1844, to J. B. Coffin, for a Washing Machine.

Very respectfully,

W. F. Woolard
Chief Clerk.

June 27, 1911.

Honorable Commissioner of Patents,
Washington, D.C.

S I R : -

In paper No. 4 in an application of Thomas A. Edison, entitled CAN OR RECEPTACLE, filed May 24, 1910, Serial No. 563,041, you advise me that the claims "are rejected on either Edison, 861,242 of record or the patent to Burke, 3422, (Br.) of 1869, (\$20-1)". I have ordered the patent of this number and the year given, and in your letter No. 120715 you advise me that you are unable to identify the patent, and state that patent No. 3422 issued to J.B. Coffin, dated February 2, 1844. I will be obliged if you will kindly advise me the correct citation in the above entitled application.

Respectfully,

ARK.

General Counsel.

600.

Div. 400m 280

2-280 LWT

Paper No. 6

Address only
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

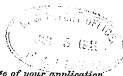
Thomas A. Edison,

WASHINGTON

July 5, 1911.

c/o Frank L. Dyer,

Orange, N. J.



Please find below a communication from the EXAMINER in charge of your application.

563,041, filed May 24, 1910 for Can or Receptacle.

E. B. Moore

Commissioner of Patents.

In response to applicant's letter received July 3, it is said
that the citation by the office of the two patents referred to
in applicant's letter, is correct. The confusion seems to be in
the fact that applicant believes the patent to Burke is a U. S.
patent. The patent to Burke is a British patent and is so cited
in the official letter of June 17, 1911.

Examiner.

P

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)	
CAN OR RECEPTACLE)	
Filed May 24, 1910	)	Room No. 175.
Serial No. 563,041)	

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office action of June 17, 1911, please amend the above entitled case as follows:-

Claim 1, line 5, before "welded" insert - exterior of the - .

Claim 2, line 4, after "upon" insert - the exterior of - .

Claim 3, line 6, after "upon" insert - the exterior of - .

R E M A R K S

As stated in the specification, applicant's invention has for its object the overcoming of a defect which arises in making storage battery cans such as are described in applicant's prior patent, No. 861,242, and involves applying an electrolytically deposited coating of a suitable metal, preferably nickel, on the exterior of a welded joint. This invention is not disclosed in any of the patents cited. Applicant's prior patent does not disclose

the application of an additional coating of nickel to the welded joint. In the British patent to Burke, the coating is applied to the inside of the barrel, and not to the exterior of the joint. The patent to Warner, No. 749,763, relates to a different art from applicant's invention and does not disclose a metallic receptacle having a welded joint.

Reconsideration and allowance are requested.

Respectfully submitted,

THOMAS A. EDISON

By

Frank L. Meyer

His Attorney

Orange, New Jersey

May 31, 1912.

Div. 40 Room 280

Address only
"The Commissioner of Patents,
Washington, D. C."

S-280 LWT

Paper No. 8

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

Thomas A. Mison,

c/o Frank L. Dyer,

Grange, N. F.

JUN 10 1912

JUN 10 1912

MAIL

Please find below a communication from the EXAMINER in charge of your application.

563,041, filed May 24, 1910 for Can or Receptacle.

E. B. Moore

Commissioner of Patents.

Responsive to amendment of June 1, 1912.

The claims are rejected on the references and for the reasons
of record.

The use of nickel plated metal is well known to the mechanic,
and the choice of this material as a substitute for that used by Burke
is not seen to involve any inventive genius. Then what applicant does,
after welding the joint, is to recoat with nickel the portion that has
been bared by the welding process. This is held to be very obvious
to the mechanic. And there is furthermore no invention in employing
an old method of depositing the nickel coating, namely the electrolytic
process.

Examiner.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)
CAN OR RECEPTACLE)
Filed May 24, 1910)
Serial No. 563,041)

Room No. 175.

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office action of
June 18, 1912, please amend the above entitled application
as follows:-

Rewrite claim 1 as follows: -

Cancelled 7/25/14

a
1. A metallic can or receptacle comprising a body
and a flanged bottom, both formed of plated metal, said
bottom being welded to the body along the edge of its flange
to form a completely closed joint, and said welded joint
having a coating of metal electrolytically deposited upon
its exterior, subsequent to welding, to protect said joint
from oxidation, substantially as described. -

Claim 2, line 3, before "welded" insert - complete-
ly closed - . Line 4, before "plated" insert - electrolyt-
ically - .

Claim 3, line 6, after "flange" insert - to form a
completely closed joint - .

R E M A R K S

In the patent to Warner, No. 749,763, sides, ends
and a bottom made of wood or similar material and having

metal facing strips on their edges are provided with an electro-deposit of metal or alloy and then secured together by nails, screws or dowel pins to form the body portion of a casket. The patentee states that the entire body then receives another electro-deposit of metal. In applicant's invention, the parts of the can or receptacle are made of metal and are welded together to form a completely closed joint. In the structure shown in Warner, the parts are not made of metal and are not welded together. Warner apparently relies upon the electro-deposit of metal to render the casket impervious to air and other fluids. The completely closed joint formed in applicant's structure by welding accomplishes this result and applicant employs the additional coating of electrolytically deposited nickel to prevent oxidation. Applicant states that it is very doubtful whether an electro-deposited metal can be formed across joints of the character employed in Warner's casket. In the British patent to Burke, No. 3422 of 1869, the interior of the cask may be coated with glass, porcelain or earthenware, or in some cases with tin or zinc. Apparently, the object of this coating is to prevent contamination of the contents of the cask by the material of the cask and to prevent the cask from being acted upon by its contents. As set forth in the claims, the protective coating employed by applicant is upon the exterior of the welded joint and is not upon the interior, as in the structure described in Burke. Furthermore, in the patent to Burke there is no disclosure of an electrolytic deposit of nickel or other metal.

None of the references of record suggests the idea of providing a protective coating of electrolytically deposited metal upon the exterior of a welded joint.

The claims now presented differentiate clearly from the references cited and are believed to be patentable.

Reconsideration and allowance are requested.

Respectfully submitted,

THOMAS A. EDISON

By Frank L. Dyer

His Attorney

Orange, New Jersey

June 16th, 1913

HL-JS

Div. 40 Room 220

Address only
"The Commissioner of Patents,
Washington, D. C."

2-2001K3 / AS

Paper No. 10

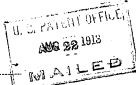
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

Aug. 22, 1913.

Frank L. Dyer,

Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of the application of

Thomas A. Edison, for Can. or Res. of, filed May 24, 1910.

#563,041.

Thomas Edison
[Signature]

Commissioner of Patents.

Responsive to amendment filed June 17, 1913.

Claim 1 is rejected and claims 2 and 3 are each again re-
jected on the references for the reasons set forth in the last
office letter.

If desired, applicant may consider this rejection as final
for the purposes of appeal, since it is not believed that any-
thing patentable has been disclosed in this case.

Examiner.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison

CAN OR RECEPTACLE

Room No. 175

Filed May 24, 1910

Serial No. 563,041

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office action of August 22, 1913, please amend the above entitled case as follows:-

Cancel the claims and insert in lieu thereof the following:-

A
A metallic storage battery container, comprising a body portion having a welded side seam, and a bottom with a downwardly extended flange within the lower end of said body portion, both said body portion and bottom being formed of nickel-plated metal, said bottom being welded to said body portion along the lower edge of said flange to form a completely closed joint, and said welded joint and the lower portion of said welded side seam having a coating of nickel electrolytically deposited upon their exterior, subsequent to welding, to protect the same, substantially as described. -

R E M A R K S

A single claim is now submitted which is believed to distinguish from the prior art. This claim is limited

to a storage battery container, inasmuch as applicant's invention is particularly useful in containers of this character, these containers being liable to be affected by electrolytic action, as is set forth in the specification. The patents cited by the Examiner have been fully discussed in previous arguments, and the Examiner's attention is again directed to these arguments. It may be again pointed out, however, that the patents cited do not show the provision of a protective coating of electrolytically deposited metal on the exterior of a welded joint.

Reconsideration and allowance are requested.

Respectfully submitted,

THOMAS A. EDISON

By

Frank L. Oyer

His Attorney

Orange, New Jersey

July 25, 1914

HL-JS

Div. 40, Room 280

2-200

Paper No. 12

Address only
"The Commissioner of Patents,
Washington, D. C."
and not my official by name.

All communications respecting this
application should give the serial number,
date of filing, title of invention, and
name of the applicant.

MKS/W

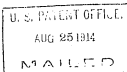
DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

Aug. 25, 1914.

Frank I. Dyer

Orange

N. J.



Please find below a communication from the EXAMINER in charge of the application of

Thomas A. Edison for Can. or Receptacle; filed May 24, 1910;

Serial No. 565,041.

19-2211

Thomas Ewing
Commissioner of Patents.

In response to amendment of July 28, 1914.

The claim is rejected on the references for the
reasons of record. Since this claim is the same in scope
as claims previously considered and rejected, this rejection
is made final.

Examiner.

June 25, 1915

Mr. Edison:

FOLIO 600 - CAN OR RECEPTACLE

This application relates to a metal storage battery can having the bottom welded to the body portion and having an electrolytically deposited coating of nickel upon the welded portion applied subsequent to welding. The claim has been finally rejected. The can itself is shown to be old in your prior patent No. 861,242, and it is not believed that there is anything patentable in the present application in view of the common practice of nickel plating metal articles. Other patents cited show ^(a) an iron barrel ^{and} ~~for~~ the top and bottom welded in place and coated on the interior with tin or zinc, and a ^(b) ~~case~~ ^{casket} formed of metal coated members secured together in any suitable manner, as by nails or screws, and an electro-deposit of metal, such as nickel, over the exterior including the joints. We do not think we would be successful in securing the allowance of the claim on appeal, and recommend dropping the case.

HL-JS

Henry Lancham

Abner [unclear]

Folio No. 602

Serial No. 565,158

Applicant.

Address.

Thomas A. Edison

Orange, N.J.

Title Moving Picture Apparatus

Filed June 6, 1910

Examiner's Room No. 3125

Assignee New Jersey Patent Co.

Ass't Exec Sept 24, 1915 Recorded Sept 25, 1915 Liber 7,98 Page 280

Patent No. 1,178,062 Issued April 4, 1916

ACTIONS.

- Rejections*
- | | | |
|----|------------------------------|----|
| 1 | Amended July 2, 1911 | 16 |
| 2 | Amended June 29, 1911 | 17 |
| 3 | Rejected August 7, 1911 | 18 |
| 4 | Amended June 10, 1912 | 19 |
| 5 | Rejected Oct. 11, 1912 | 20 |
| 6 | Amended July 26, 1913 | 21 |
| 7 | Rejected Oct. 13, 1913 | 22 |
| 8 | Amended Sept 26, 1914 | 23 |
| 9 | Rejected Oct. 20, 1914 | 24 |
| 10 | Amended Sept. 13, 1915 | 25 |
| 11 | Allowed Sept. 20, 1915 | 26 |
| 12 | Final fee due March 20, 1916 | 27 |
| 13 | " " Paid March 7, 1916 | 28 |
| 14 | " " | 29 |
| 15 | " " | 30 |

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

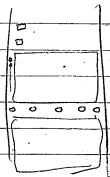
Red, Dyer Smith
May 10 1910
Chas. Lewis
May 10 1910

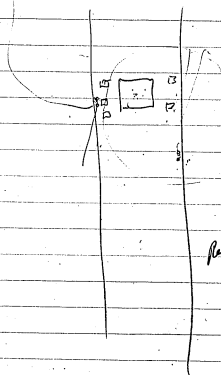
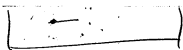
Dyer

Idea - on films
have control holes punched at
proper places, that will
control a shutter between
light & film or at entrance
to color the light. many
combinations could be
made, also these control
holes could close ^{elect} contact
& control behind curtain
pistol shots falling bodies
(various sound absolutely
concurrent & exactly times)

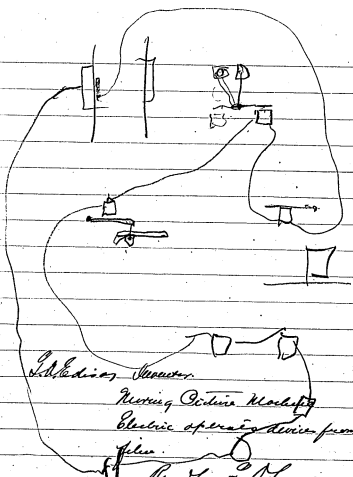
2

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May 10/1910
 P. D. Leavitt
 Ready, Leavitt
 May 10/1910



Ed. Leavitt, Rochester
 Moving Picture Machine
 Electric operating device from
 film
 Ready, Leavitt
 May 20/1910

Chadwick Review
#

7 Sheet Contact arrangement
Moving Picture Machine film

Rough
J. N. Kuri

May 24 1910



Folio No. 603

Serial No. 565,157

Applicant.

Address.

Thos. A. Edison Orange, N.J.

Title Storage Batteries

Filed June 6, 1910. Examiner's Room No. 175

Assignee Edison Storage Battery Co.

Ass't g't Exec. H.H. Recorded July 2, 1912 Liber 289 Page 389

Patent No. 1,036,471 Issued Aug. 20, 1912.

ACTIONS.

- | | | | |
|----|--|----|----------------------------|
| 1 | Office Letter July 12, 1910 | 16 | |
| 2 | Amended June 5, 1911 | 17 | Pay final fee Nov. 1, 1912 |
| 3 | Office Letter June 17, 1911 | 18 | |
| 4 | Amended May 31, 1912 | 19 | |
| 5 | allowed June 11, 1912 | 20 | |
| 6 | Final fee due Dec. 11, 1912 | 21 | |
| 7 | " " paid July 24, 1912 | 22 | |
| 8 | Correction of patent requested Aug. 24, 1912 | 23 | |
| 9 | Request granted Sept. 9, 1912 | 24 | |
| 10 | | 25 | |
| 11 | | 26 | |
| 12 | | 27 | |
| 13 | | 28 | |
| 14 | | 29 | |
| 15 | | 30 | |
- No foreign*
- PAULT**

FRANK L. DYER,
Counsel,
ORANGE, NEW JERSEY.

REFER TO THIS NUMBER
IN YOUR REPLY

1457

Folio 603

MEMORANDUM

FRANK L. DYER,
CHANCE, N. J.

Mr. Dyer Smith:

4/26/10.

I hand you herewith memorandum from Mr. Edison on the subject of new applications, which I wish you would take right up for preparation.

I think the second point has been covered, except possibly the specific suggestion of using bismuth with a nickel hydroxide in alkaline electrolyte containing lithia. My recollection is that the use of bismuth and lithia are covered in separate patents. Mr. Edison may be able to give reasons why the two co-operate so as to warrant a combination claim.

I think the third paragraph has also been covered, but

(2)

am not sure.

The fourth suggestion has been covered in at least one patent.

The eighth suggestion has also been covered.

Find out from Mr. Edison what the new phonograph applications are and go right ahead with their preparation. You will note that he brings up again the question of using Boron as a material for reproducing point.

FLD/IWW

F. L. D.
FD

Enc-

Disclosed to me by Mr. Edson
May 12 1910 Dyce Smith

Mixed with the Crushed
powder of Nickel hydroxide
I add say 20% or less of
Bismuth Oxide also crushed
up to powder - & use
the mixed product to load
the tubes with -
also instead of Bismuth
Oxide, I can use the powdered
metal, in this case but
15 or 16% is only necessary

873,220
Have patent where Bis was
chemically preceptd with
the Nickel hydrox -

I think I have patent
where the Ni hydrox
was soaked in a

yes.
No.
446
540

2

Solution of a Bisumuth
Salt such as BiCl_3
dissolved in Chloride of
ammonia & the
resultant decomposed
by an alkali &
washed, free of salts,
The Ni hydrox then contains
say 20% of Bi_2O_3
or hydrox & this can
be used if I haout
this patented you bet,
patent it =

The mixing of the Bi_2O_3
or ~~hydrox~~ with the Ni hydrox is
^

3

Simple & cheaper —
& ~~is~~ is the preferable
way =

The action of Bisumuth
is to increase the
Capacity & Stability
of the Positive Element
~~but~~ but the reason is
not well known it
is probably due to
making of better
Electrical Contacts
between the Ni hydrox
& Metallic flake & tube
as under the action

4

of the Current the Bismuth
oxidizes to an oxide which
is a Conductor of Electricity
& ~~the Bismuth~~ when discharging
the N. ~~oxide~~ Oxide, it remains
a Conductor even if the
cells reversed so that
the Bi Oxide is reduced
to metal which is a
conductor so that under
all conditions of working
The Bismuth or its oxide
formed electrolytically
is a Conductor of
Electricity.
This is unique

Folio No. 607

Serial No. 267,371

Applicant.

Address.

Thomas A. Edison

Orange, N.J.

Title Electrode Element

Filed June 17, 1910.

Examiner's Room No. _____

Assignee. Edison Storage Battery Co.

Ass'g't Exec. Aug. 22/14 Recorded Aug. 24/14 Liber K 95 Page 324

Patent No. 1,115,463 Issued October 27/1914

ACTIONS.

- 1 Office letter July 16, 1910. 16
- 2 Amended June 5, 1911 17
- 3 Official letter June 19, 1911 18
- 4 Amended Feb. 13, 1912 19
- 5 Office letter March 2, 1912. 20
- 6 Supplementary office letter 4/2/13 21
- 7 Amended Feb. 28 - 1913 22
- 8 Additional Amendment March 3/13 23
- 9 Office letter Mar. 29 - 1913 24
- 10 Amended March 25 - 1914 25
- 11 Allowed Apr. 4 - 1914 26
- 12 Final fee due Oct. 6 - 1914 27
- 13 _____ 28
- 14 _____ 29
- 15 _____ 30

VAULT

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

Depos June 18 1907
R.D. 11/07
G.L.P.
7003

The object of this invention is to form a mixture of Nickel hydroxide and conducting material in closed non-extensible perforated ~~into~~ Containers, whereby the ~~minimum~~ the largest area of contact ~~is~~ between the conducting flake & the Nickel hydrox. is obtained, and the preservation over extended periods of time of the original contact, so that the capacity of the Nickel element in an alkaline accumulator shall be very constant.

The invention consists in mixing the ~~conducting~~ Nickel hydroxide particles and flake with in a dry state ~~and~~ simultaneously

2

at the time of packing the same in the receptacles -

It further consists in so arranging the feed of the two materials so that in the act of falling into the Containers just before the packing tool operates there shall be a minimum of segregation by causing the flake to fall in advance of the Nickel hydroxide & feeding the latter in a stream ~~after~~ so that the flake & Nickel hydroxide when at the bottom of the tube will be as evenly mixed as possible

The flake falls slower than the nickel powder & if both were ~~or~~ dropped in the tube ~~at~~ simultaneously ~~the~~ a section would be formed wherein ~~the~~ nearly the whole of the flake would be found in the top part. But if the flake is fed first ~~and~~ ~~and~~ then the nickel is fed gradually & after the flake the resultant of the two will be ^{nearly} an even mixture & all that is desirable —

The best proportions as to size of the flake is through 20 mesh & the nickel Hydrex through 30 mesh

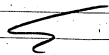
then by a simple adjustment of the packing machine — as above described the best possible mixing will take place:

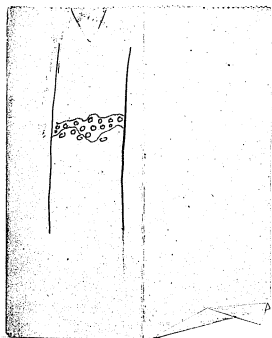
To insure that the mixture shall have the greatest area of contact ~~this~~ it should be put in in small sections of about 150 sections per inch of tube with a weight of 4 lbs on the plunger & a fall of about 6 inches — & it is preferable that two falls of the weight should take place for each section as the ^{plunger} blow is nearly all used up in crushing &

forcing the materials in
position & the 2nd blow
causes a very much stronger
packing & consolidating effect
to ensure good contacts -

Defens: You already have
the apparatus for old process
& perhaps you will have
to mention it in here -

Want show you result
under microscope





-MEMORANDUM-

Regarding attached note, an examination thru the microscope shows the packing of foil and flakes somewhat like the enclosed sketch, the flakes forming substantially continuous but irregularly disposed layers separating the active material, and there being more or less mixing of the flakes and the active materials. Porosity is obtained by reason of the porosity of the active material itself. The trouble with the molasses process was that the presence of the molasses prevented as close packing as is desired, and also interfered with the contact, because when the molasses was dissolved out, the films would be separated more or less from the active particles. By having no molasses the films and particles are jammed inwardly together so as to form a perfect contact. If it were attempted to feed the two materials simultaneously either by separate simultaneous introductions of charges of flakes and active material, or by a dry mixture of the two, the active material by reason of its weight would fall more rapidly than the flakes so as to fall in clearly defined layers. This is not what is wanted. Good practice requires a distribution of the flakes throughout the mass, while at the same time, the flakes should conform continuous conductors across the tubes.

F.L.D.

June 20/07.

Folio No. 611Serial No. 570,913

Applicant.

Address.

Thomas A. Edison
Orange, N. J.Title ^{Method of} Means for Utilizing Waste Heat in KilnsFiled July 7, 1910 Examiner's Room No. 325Assignee Thomas A. Edison Inc.Ass't Exec. June 30, 1916 Recorded July 7, 1916 Liber 9127 Page 50Patent No. 1167637 Issued January 11, 1916

ACTIONS.

- 7 copies with Mr. Edison
New Brunswick, N. J.*
- | | | |
|------------------|-------------------|----|
| 1 Rejected | Aug. 26, 1910 | 16 |
| 2 Amended | Aug. 22, 1911 | 17 |
| 3 Rejected | Oct. 12, 1911 | 18 |
| 4 Amended | October 24, 1912 | 19 |
| 5 Rejected | November 19, 1912 | 20 |
| 6 Amended | Nov. 12, 1913 | 21 |
| 7 Rejected | Dec. 16, 1913 | 22 |
| 8 Amended | Nov. 7, 1914 | 23 |
| 9 Rejected | Dec. 9, 1914 | 24 |
| 10 Amended | Nov. 19, 1915 | 25 |
| 11 Allowed | Nov. 29, 1915 | 26 |
| 12 Final Fee due | May 29, 1917 | 27 |
| 13 Paid | Dec. 10, 1915 | 28 |
| 14 | | 29 |
| 15 | | 30 |

FRANK L. DYER,
Counsel,
ORANGE, NEW JERSEY.

Received May 28 1910
Dyers Smith

611

26 May 1910

Dyers Smith

Received May 28 1910

You remember I applied for
a patent some time ago
where steam pipes were
placed in a large dust
catching chamber at the
End of Cement Kiln. These
pipes acted as a boiler
to run Engines - The excess steam
over that ~~was taken by the engine~~
was continuously blown off
so that the Steam boiler
should always cool the
gases to the same degree
no matter if the Engine
was working or not
I now want to file
application for an

2

improvement -

Which is that
on account of ~~the~~
trouble from leaks in
the joints of the Tubes
composing the boiler
due to the high steam
~~pressure~~ pressure which
is necessary to use
with the ordinary
Engine that I avoid
this trouble by substituting
a low pressure turbine
alone & obtaining power
solely by utilizing the
Vacuum, with the same
provision to keep temperature fluid
same by ~~losing~~ ~~excess power~~ ~~Steam~~

FORM 474



The Edison Portland Cement Co.

THOMAS A. EDISON, CHAIRMAN OF BOARD
W. M. MALLORY, TREASURER
J. LANTON THOMPSON, VICE-PRESIDENT
H. P. DILLON, SECRETARY
Wm. D. HOBBS, JR., & SONS, VILLAS

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS, STEWARTSVILLE, N. J.

SALES OFFICES:
PHILADELPHIA, PA., Arcade Building
NEW YORK, N. Y., St. James Building
NEWARK, N. J., Union Building
BOSTON, MASS., Post Office Square Bldg
BALTIMORE, MD., National Bank Building

September 28, 1920

Mr. Thomas A. Edison,
Orange, N. J.

Dear Sir:-

Enclosed herewith please find a letter
from the Green Fuel Economizer Co., which states that
they have recently patented a system whereby by special
adaptation of economizer and low pressure turbine, waste
heat from the kilns of a cement plant can be utilized.

As this is a matter which you have
discussed with me a good while ago, I thought it well
to mention it to you at once, so you could investigate
the patents and see whether there was any virtue in them.

Yours very truly,

Wm. D. Hobbs, Jr.

Superintendent.

WHM-HBS

ENCLOSURE:-

*Green Fuel
4/16
x 6 11*

*Goodman
Have the
looked
up - Wm*

*Legal Dept, we had
an application on this
look up & see if there
people have
any patents*

S

THE GREEN FUEL ECONOMIZER CO.

CABLE ADDRESS:
"ECONOMIZER"
MATTEAWAN, N. Y.

DESIGNERS AND BUILDERS OF APPARATUS FOR
WASTE HEAT UTILIZATION
MECHANICAL DRAFT. HEATING AND VENTILATING.
DRYING. CONVEYING BY AIR EXHAUSTION.

CODE 8:
A.B.S. EDITION, WESTERN UNION.
ENGINEERING TELEGRAPH.

GENERAL OFFICES AND WORKS, MATTEAWAN, N. Y.

Sept. 22, 1910.

Mr. W. H. Mason,
Stewartsville, N. J.

Dear Sir:-

You have undoubtedly often been impressed by the fact that a large proportion of the heat which you pay for in the fuel is wasted from the kiln stacks, from the boiler stacks, or radiated from the hot clinker. Several prominent cement manufacturers have found that a large per cent of this waste can be prevented.

Several systems for saving this waste heat are described in our special booklet entitled, "Power for Cement Mills from Waste Heat", which we are forwarding to you under separate cover.

You will note that we have devised three separate systems for utilizing the waste heat from kilns, and also a system for utilizing the heat usually wasted by the clinker. All of these systems are in successful operation, resulting in substantial reductions of fuel bills.

Equally good results could undoubtedly be obtained in your plant and if you will give us such data as

The number of kilns,
Temperature of escaping gases,
Quantity of fuel burned per hour per kiln, and
Amount of power generated,

We shall be glad to have our engineers figure out what an economizer will save in your plant.

We might mention that these systems in no wise interfere with the operation of the kilns, as we can preserve any draft relations you wish.

Several of our engineers have made a study of this situation and would be glad to take the matter up further with you upon receipt of the data mentioned above, informing you whether it would be possible to use a system we have recently patented, whereby a large percentage of the power necessary in cement mills can be supplied by a special adaptation of the economizer and a low-pressure turbine.

Very truly yours,

THE GREEN FUEL ECONOMIZER CO.,

A. H. MacKinnon

General Manager

Folio No. **639**Serial No. **579, 706**

Applicant. *Thomas A. Edison* Address. *Lawrence Park*
West Orange
N.J.

Title *Vehicle Wheels*

Filed *Aug. 30, 1910.* Examiner's Room No. _____

Assignee. _____

Ass't Exec. _____ Recorded _____ Liber _____ Page _____

Patent No. _____ Issued _____

ACTIONS.

1	<i>Rejected Sept. 22, 1910.</i>	16
2	<i>Amended Oct. 19, 1911.</i>	17
3	<i>Rejected Nov. 6, 1911.</i>	18
4	<i>Amended Oct. 24, 1912.</i>	19
5	<i>Rejected Dec. 2, 1912.</i>	20
6		21
7		22
8		23
9		24
10		25
11		26
12		27
13		28
14		29
15		30

[Handwritten signatures and initials are present in the right margin of the ACTIONS section.]

FRANK L. DYER,
 Counsel,
 ORANGE, NEW JERSEY.

The invention is

A Wheel for Vehicles, the rim of which is composed of moving sections ~~of spring~~ ~~the~~

Ends of which support the vehicle on the road, the sections free to move & each spring connected to the wheel —

The number & disposition such as that ~~define the section~~ several sections are in contact with the ground & serve for support. The resilient device between the section & the wheel permitting the sections to take up various positions so that with a small rock or stone being passed over the rim will deform to the contour without lifting the wheel.

It was an attempt ^{not only to} ~~to~~ imitate the action of a pneumatic rubber tire, but to improve upon the action of that tire, and at the same time produce a more reliable wheel at less expense both initially & afterwards —

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, West Orange, in the County of Essex and State of
New Jersey

prays that letters patent may be granted to him for the improvements in

VEHICLE WHEELS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration No. 560), of Orange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thos. A. Edison

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN that I, Thomas A. Edison, of the United States, residing at Mewellyn Park, West Orange, County of Essex and State of New Jersey, have invented a certain new and useful improvement in VEHICLE WHEELS of which the following is a specification:

My invention relates to wheels for vehicles and particularly to that class of wheels having resilient contact with the road surface. At the present time vehicle wheels are provided for this purpose with cushioning or resilient devices made principally of rubber and for the most part with pneumatic rubber tires containing air under pressure. Such tires are of high initial cost, are easily injured and are relatively short lived. The object of the present invention is to construct a vehicle wheel in such a manner that it shall have all the advantages of resilient contact with the road surface possessed by wheels equipped with pneumatic rubber tires, and which shall not contain the numerous inherent and inevitable ^{dis-}effects of wheels so equipped. This object I accomplish by making the tread of the wheel, which is the portion coming into contact with the road, of numerous sections resiliently supported upon the rim of the wheel, thus permitting the sections to take up various positions so that, for instance, when a small stone or other irregularity in the road is passed over, these movable tread sections will conform to the contour of any small object

which may be encountered with little or no effect on the wheel itself. These sections are sufficiently numerous and are so disposed that several of them are at all times in contact with the road and serve collectively to secure the resilient support of the wheel with its load. With this arrangement, when an object is encountered which is so small that it contacts with less than the entire number of tread sections necessary to support the weight of the wheel and its load, the effect will be merely to cause the small number of sections contacted to yield to an increased extent with substantially no resulting displacement of the wheel or vehicle.

With the above and related objects in view, my invention consists in the parts, improvements and combinations of elements hereinafter described and claimed.

In the drawings forming a part of this specification, Figure 1 is a longitudinal, sectional view taken on line 1 -- 1, Figure 2, of a fragment of a vehicle wheel embodying my invention; Figure 2 is a plan view of ^{a portion of the said wheel} ~~(the fragment of the wheel shown in Figure 1)~~; Figure 3 is a cross-sectional view taken on the line 3 -- 3, Figure 2; and Figure 4 is a side elevational view of a portion of ^{the said} ~~a~~ vehicle wheel embodying my invention and showing the same in contact with an obstacle in the road.

Reference numeral 1 indicates the rim of the wheel which is hollow and which preferably comprises an inner portion 2, an outer portion 3 and side portions 4, 4, which may be autogenously welded to the inner and outer portions 2 and 3. The outer portion 3 of the wheel rim is provided

with openings 5, 5, and in these openings are received the movable tread sections 6, 6. In the drawings I have shown three rows of tread sections 6, but a greater or less number of rows of such sections may be used as will be understood. These tread sections are preferably arranged in staggered relation, as shown, for the better distribution of the load upon the road surface and to afford a substantially continuous tread for the wheel.

The tread sections 6, which are made of metal and preferably of the best quality of case hardened steel, comprise heads 7 and shanks 8 which are screw threaded at the ends opposite the heads 7. The under surfaces of the heads 7 are recessed at 9 to provide a seat for receiving the end of powerful coil springs 10, and the shanks 8 are passed through openings 11 in the inner portion 2 of the rim in line with the openings 5 in the outer rim portion 3, and after the sections 6 and springs 10 are in place, nuts 13 are secured upon the threaded shanks 8. Any convenient form of nut lock may be used to prevent rotation of the nuts on the shanks, cotter pins 14 being illustrated for this purpose in the drawings. Washers 15, which may be of ordinary red fibre, are provided between the nuts 13 and the inner rim portion 2, and in order to deaden the sound due to recoil I may provide a covering of canvas or similar material 16 on the inner surface of the inner portion 2 of the rim, and in such case the openings 11 are made to pass through the strip of canvas as well as through the portion 2 of the rim. With this construction the separate tread sections may readily be removed from the wheel

for repair or replacement, it being necessary merely to screw off the nut 13 of the section it is desired to remove when the section can be taken out. The nut 13 is also used as a means of adjustment to control the degree of spring tension upon the tread sections 8 and the amount of their projection from the wheel rim as will be readily understood.

The operation of the wheel in use is clearly shown in Figure 4 of the drawing. When a vehicle provided with wheels such as I have described is run over a smooth road, as the tread sections of the wheel come in contact with the road surface they are pressed inward toward the centre of the wheel against the outward pressure of the springs 10, and afford a yielding support for the wheel upon the road surface in substantially the same way as in the case of a wheel equipped with the well known pneumatic rubber tire, the number of sections which give to the road pressure being controlled by the degree of tension under which the springs 10 are put by means of the nuts 13. When small obstacles, such as stones, are encountered the resulting jolt is principally taken up in forcing the tread sections 8, which are struck by the obstacle, into their seats in the wheel rim, and but little or none of the jolt or disturbance is communicated to the wheel itself and by it to the vehicle.

Having now described my invention, what I claim is:-

- Cancelled 9/11/11 substituted claims 1-11-11/11*
1. A vehicle wheel comprising a rim and numerous separate tread sections adjustably and removably spring connected thereto, substantially as described.

Cancel

2. A vehicle wheel comprising a metallic rim and numerous separate tread sections made from case hardened steel and adjustably and removably spring connected thereto, substantially as set forth.

Cancelled

3. A vehicle wheel comprising a rim, tread sections extending outwardly therefrom, and means for yieldably supporting said sections on said rim, substantially as set forth.

Cancelled

4. A vehicle wheel comprising a rim, tread sections extending outwardly therefrom, and springs for holding each tread section yieldably in its extended position, substantially as set forth.

Cancelled

5. A vehicle wheel comprising a hollow rim, tread sections normally extending from the outer portion thereof and springs bearing against the inner wall of said rim for holding the said tread sections yieldably outward, substantially as set forth.

Cancelled

6. A vehicle wheel comprising a rim, numerous relatively small tread sections extended outwardly therefrom, and means for yieldably supporting said tread sections on the rim, the said tread sections being so arranged and of such size that a plurality thereof come into contact with the ground at one and the same time, substantially as set forth.

Cancelled

7. A vehicle wheel comprising a rim, numerous relatively small tread sections extending outwardly therefrom around the periphery thereof, and individual springs for

holding each tread section in this extended position, the size and arrangement of the tread sections and the strength of the projecting springs being such that a plurality of the tread sections come into contact with the ground at one and the same time, substantially as set forth,

Cancel

8. A vehicle wheel comprising a rim, movable tread sections extending outwardly therefrom, means for holding the tread sections yieldably outward, and means for limiting the outward movement of the tread sections, substantially as set forth.

Cancel

9. A vehicle wheel comprising a hollow rim having openings in its outer wall, tread sections extending through said openings, and springs contacting with the inner wall of said rim for resiliently supporting the tread sections, substantially as set forth.

Cancel

10. A vehicle wheel comprising a rim, separate tread sections projecting therefrom around its periphery, individual springs for holding the sections projected, the force of spring projection applied by its spring to any individual tread section being sufficient to support but a fraction of the weight of the wheel and its load, substantially as set forth.

Cancel

11. A vehicle wheel comprising in combination a hollow rim having openings in its outer wall, tread sections extending through said openings and provided with shanks extending through openings in the inner wall of the rim aligned

Cancel

with those in the outer wall, and coil springs encircling the said shanks and holding the said tread sections resiliently projecting from the outer wall of the wheel rim, substantially as set forth.

12. A vehicle wheel comprising in combination a hollow rim having openings in its outer wall and aligned openings in its inner wall, tread sections having heads extending through the openings in the outer wall, and shanks extending through the aligned openings in the inner wall, coil springs interposed between the bases of said heads and the inner wall of the wheel rim and encircling said shanks, the inner ends of said shanks being threaded and nuts on the said threaded ends to limit the outward movement of said tread sections, substantially as set forth.

Cancel

13. A vehicle wheel comprising a rim and numerous spring supported tread sections about its periphery, the spring pressure applied to any individual section being sufficient to support but a fraction of the weight of the wheel and its load, so that the tread sections coming into contact with small obstacles in the road are depressed thereby without lifting the wheel, substantially as set forth.

Cancel

14. A vehicle wheel comprising a rim, numerous tread sections mounted thereon and forming a substantially continuous tread, individual springs for holding each tread section yieldably projected outward, the pressure of any individual spring upon its tread section being such that it will support but a fraction of the weight of the wheel and its load, so that the tread sections give way to small obstacles in the road, permitting the wheel to pass thereover without being lifted, substantially as set forth.

Cancel

This specification signed and witnessed this 29 day of August 1901

Thomas A. Edison

Witnesses:

1. H. H. Dyke
2. Delos Holden

Oath.

State of New Jersey } ss.,
County of Essex }

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, West Orange, in the County of Essex and State of New Jersey

that he verily believes himself to be the original, first and sole inventor of the improvements in

VEHICLE WHEELS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Thomas A. Edison
Sworn to and subscribed before me this 29 day of August 1901
H. H. Dyke
Notary Public.

[Seal]

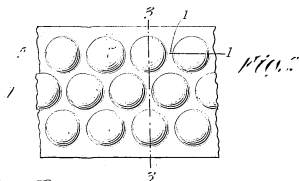
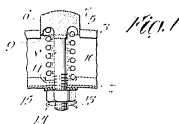
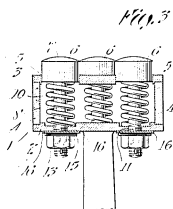
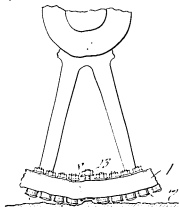


Fig. 4



Witnesses:

Frank D. Lewis
A. H. Dyke

Inventor:

Thomas A. Edison

Div. 41 Room 125
Address only
"The Commissioner of Patents,
Washington, D. C."

2-200

Paper No. 2

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

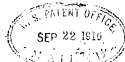
DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

September 22, 1910.

Thomas A. Edison,

C/o Frank L. Dyer,

Orange N. J.



Please find below a communication from the EXAMINER in charge of your application.

Serial No. 579,706, filed August 30th, 1910. "Vehicle Wheels"

E. B. Wilson

Commissioner of Patents.

The line 1-3 should be placed on the drawing.

Page 1, line 19, "effects" should be defects; line 20,
"which" should be that.

Page 2, lines 19 and 20, the brief description of Fig. 2
is objected to. The "fragment" illustrated is greater than that
shown in Fig. 1.

Claims 1, 2, 3, 4, 5, 8 and 10 are rejected upon any of the
following references:-

✓ Murrey	927,578	July 13, 1909	152-28 Rim.
✓ Frankbner	866,028	Sept. 3, 1907	152-28
✓ Bunker	819,039	May 1, 1906	152-8
✓ Bozarth	945,688	Jan. 4, 1910	152-8
✓ Kimball	816,666	April 3, 1906	152-28
✓ Wicks	889,077	May 26, 1908	152-28
✓ Alloati	863,827	Aug. 20, 1907	152-8
✓ British	15,443	of 1905	152-8
✓ British	22,203	of 1904	152-28 X
✓ British		34 of 1893	152-28 Rim

Claims 6, 7, 9, 13 and 14 are rejected upon Murrey, Wicks, Alloati,
or any of the foreign references cited against Claim 1.

Claim 11 is rejected upon Murrey or Wicks, cited.

Claim 12 is rejected upon Murrey, cited, or

Barnett 20,318 May 25, 1898 152-28 X

Asst. Examiner Division 41.

625

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)

VEHICLE WHEELS)

Filed August 30, 1910)

Serial No. 579,706)

Room No. 125.

HONORABLE COMMISSIONER OF PATENTS,

S I R :

In response to the Office action of September 22, 1910, please amend the above entitled application as follows:-

Page 1, line 19, change "effects" to - defects - .

Page 2, lines 19 and 20, change "the fragment of the wheel shown in Figure 1" to - a portion of the said wheel - .

Same page, lines 22 and 23, change "a vehicle wheel embodying my invention" to - the said wheel - .

Erase the claims and substitute the following:-

Cancelled 10/34/12
1. A vehicle wheel comprising a hollow rim having continuous side portions, and outer and inner portions provided with oppositely disposed openings, tread sections having heads slidably and closely fitting in the holes of the outer portion, and shanks slidably and closely fitting in the holes of the inner portion, resilient means tending to force the tread sections outwardly, and means co-operating with the inner ends of the shanks for limiting the outward movement of the tread sections, substantially as described.

Amended 10/24/12

2. A vehicle wheel comprising a hollow rim having continuous side portions, and outer and inner portions provided with oppositely disposed openings, the said portions being autogenously welded together, tread sections having heads slidably and closely fitting in the holes of the outer portion and shanks slidably and closely fitting in the holes of the inner portion, resilient means tending to force the tread sections outwardly, and means cooperating with the inner ends of the shanks for limiting the outward movement of the tread sections, substantially as described.

3. A vehicle wheel comprising a hollow rim having continuous side portions, and outer and inner portions provided with oppositely disposed openings, tread sections having heads slidably and closely fitting in the holes of the outer portion and shanks slidably and closely fitting in the holes of the inner portion, resilient means tending to force the tread sections outwardly, and adjustable means for limiting the outward movement of the tread sections, substantially as described.

4. A vehicle wheel comprising a hollow rim having continuous side portions, and outer and inner portions provided with oppositely disposed openings, the said portions being autogenously welded together, tread sections having heads slidably and closely fitting in the holes of the outer portion and shanks slidably and closely fitting in the holes of the inner portion, resilient means tending to force the tread sections outwardly, and adjustable means for limiting the outward movement of the tread sections, substantially as described.

Insert B 10/24/12 - amended 1

REMARKS

The references cited in this application have been carefully considered, and the new claims are believed to distinguish patentably from the prior art as disclosed by the said references. It is believed that applicant has devised a simpler and more efficient structure than that disclosed in the references. The rim in applicant's wheel is composed of continuous side portions and of outer and inner portions in which the holes are always closed by the heads and shanks of the tread sections. As a result the entrance of dirt and grit into the rim chamber and into contact with the springs is prevented. Furthermore, the rim may be formed of portions autogenously welded together, and a maximum strength with a minimum of material is thereby attained. In applicant's improved vehicle wheel, the members may be easily assembled and the tension of the springs and position of the tread sections readily adjusted. Furthermore, the parts liable to be worn out may be easily replaced.

In the patent to Murrey, No. 927,587, the heads of the tread sections do not fit closely in the holes in the outer portions of the rim, and the springs are exposed to the abrading and wearing influences of the road material. In the structures shown in Fankboner, Bunker, Bozarth, Kimball, Wicks, Alloatti, British Patents Nos. 13,443 of 1905 and 22,203 of 1904, no adjustable means is disclosed for limiting the outward movement of the tread sections, and these patents do not show tread section shanks extending through holes in the inner portion of the rim, and having means co-operating with the inner ends

of the shanks for limiting the outward movement of the tread sections, whereby the adjustment discussed above is rendered possible. In the British patent No. 13,443 of 1905, in order to remove the tread portions, the sides of the rim must be removed, which would render the use of an autogenously welded rim out of the question in this structure. Applicant's structure clearly has many mechanical advantages over the structures shown in the patent to Barnett and in the British patent No. 34 of 1893. The patent to Barnett does not show outer and inner rim portions in which the heads and shanks of the tread sections fit closely. The British patent No. 34 of 1893 does not show an enclosed rim portion and the entire spring structure is exposed to the deteriorating influences of the road material. None of the references discloses a rim composed of continuous side portions and outer and inner portions autogenously welded together.

Reconsideration and allowance are requested.

Respectfully submitted,

THOMAS A. EDISON

By Frank L. Dyer

His Attorney

Orange, New Jersey

September 19, 1911.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison)

VEHICLE WHEELS)

Room No. 125

Filed August 30, 1910)

Serial No. 579,706)

HONORABLE COMMISSIONER OF PATENTS,

S I R :

The Office Draughtsman is requested to apply the section line 1-1 to Figure 2 as indicated in red ink on the enclosed print. If there is any charge for this service, please make it against the account of Frank L. Dyer, Orange, N. J.

Respectfully,

THOMAS A. EDISON

By Frank L. Dyer
His Attorney

Orange, New Jersey

September 19, 1911.

DRAFTSMAN'S DIVISION.
ADDRESS ONLY
THE COMMISSIONER OF PATENTS,
WASHINGTON, D. C.

2-108.

~~FOH~~

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.

Sept. 25, 1911.

Mr. Frank L. Dyer,
Orange, N. J.

Sir:

Referring to your order dated Sept. 19, 1911, for
correction of drawing in the application of

Edison

Serial No. 579706, filed Aug. 30, 1910, you
are advised that the drawing was corrected and forwarded to the
Examiner in charge of the case, on Sept. 25, 1911.

By direction of the Commissioner.

Very respectfully,

W. F. Woolard,

Letter No. 177386

Chief Clerk.
Per *as*

G-2224

630

Div. 41 Room 125

Address only
"The Commissioner of Patents,
Washington, D. C."

2-200

Paper No. 5

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

LJR-Fr

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

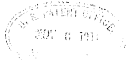
Nov. 6, 1911. 670

Thomas A. Edison,

c/o Frank L. Dyer,

Orange, N.J.

Please find below a communication from the EXAMINER in charge of your application,
for "Vehicle Wheels" filed Aug. 30, 1910, Serial No. 579,706.



E. B. Moore

Commissioner of Patents.

In response to amendment filed Sep. 20, 1911.

The claims are rejected as unpatentable over Barnette of record,
it being considered to be a mechanical expedient to substitute a hollow
rim of welded sections for the rim shown in Barnett.

Murray of record, with the concentrically opposed openings in the
flanges 8 and 9 is considered to be the substantial equivalent of the
device claimed.

Examiner Division 41.

IN THE UNITED STATES PATENT OFFICE.

Thomas A. Edison,)
VEHICLE WHEELS)
Filed August 30, 1910) Room No. 125
Serial No. 579,706)

HONORABLE COMMISSIONER OF PATENTS.

S I R :

In response to the Office action of
November 6, 1911, please amend the above entitled case
as follows:

Cancel claims 1 to 4 and insert the following
claim:

1. A vehicle wheel comprising a
hollow rim having continuous side portions, and continuous
outer and inner portions provided with oppositely disposed
openings, the said portions being autogeneously welded
together, tread sections having heads slidably and
closely fitting in the holes of the outer portion and shanks
slidably and closely fitting in the holes of the inner
portion, resilient means enclosed by said rim and tending-
to force the tread sections outwardly, exposed adjustable
means for limiting the outward movement of the tread
sections and sound deadening means carried by the inner
portion of said rim for cooperation with said adjustable
limiting means, substantially as described.

REMARKS.

It is submitted that the single specific claim presented in this amendment clearly and patentably distinguishes from the references Barnett and Murrey. Neither of these references discloses a vehicle wheel having a hollow rim consisting of continuous outer and inner portions and continuous side portions autogeneously welded together. Nor do either of these references disclose a wheel having a hollow rim and resiliently mounted treads projecting through holes formed in the outer and inner portions of the rim, the projecting portions of the treads closely fitting the holes in the rim. Such a construction prevents the entrance of dirt or other injurious matter into the rim chamber, thus protecting the springs enclosed by the rim from the injurious effects which would result if such matter came into contact with the springs.

In the construction described in the claim, easy access may be had to the limiting means for adjusting the same. This is not true in the device disclosed by Barnett as the nuts d are entirely enclosed by the curved discs E to which are also bolted the annular discs F. Therefore, in order to get at these nuts d, it would be necessary to remove both the discs F and E. ^{The} Claim further differentiates from the references by the inclusion of the sound deadening means carried by the rim and cooperating with the adjustable limiting means.

It is not apparent how either of the devices disclosed by Murrey and Barnett could be modified in view of the other to produce the construction described in the claim, without the exercise of invention.

The device disclosed by the applicant is simple, efficient, and cheap to manufacture, and it is submitted that he is entitled to the protection afforded by the claim herewith presented.

Very respectfully,

THOMAS A. EDISON,

By Frank L. Rogers

His Attorney.

Orange, New Jersey

October 24, 1912.

DIV. 41 Room 125

2-260

Paper No. 7

Address only
"The Commissioner of Patents,
Washington, D. C."

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

Dec. 2, 1912.

Thomas A. Edison,

c/o Frank L. Dyer,

Orange, N.J.

Please find below a communication from the EXAMINER in charge of your application.
for "Vehicle Wheels" filed Aug. 30, 1910, Serial No. 579,706.

9-6-1231

E. B. Moore

Commissioner of Patents.

In response to amendment filed Oct. 25, 1912.

The claim submitted is rejected as unpatentable over Barnett of record. It is believed that the pressure of the autogeneously welded sections of the rim instead of the rims shown in Barnett does not amount to invention. To provide washers on the bolt members to lessen the noise is a more mechanical expedient.

This rejection may be considered as final for purposes of appeal if applicant so desires.

Examiner Division 41.

A vehicle wheel comprising a hollow rim
 having an inner portion, an outer portion
 and side portions ~~substantially~~ ^{substantially} ~~separated~~
~~together~~, the said inner portion and outer
 portions being provided with oppositely disposed
 openings, tread sections having heads and
 shanks slidably fitting in the holes of the
 outer portion and shanks slidably fitting
 in the holes of the inner portion

2, 4
 the said portions
 being ^{substantially}
 integral together

1 A vehicle wheel comprising a hollow rim
 having continuous side portions and
 outer and inner portions provided with
 oppositely disposed openings, tread sections
 having heads ^{and shanks} slidably fitting in the holes of
 the outer portion and shanks ^{and heads} slidably fitting
 in the holes of the inner portion, resilient
 means disposed between ~~the~~ ^{the} tending to
 force the tread sections outwardly, and means
 cooperating with the inner ends of the
 shanks for retaining ~~in place~~ ^{in place} limiting
 the outward movement of the tread sections,
 o - a - d -

3 adjustable means for limiting the outward
 movement of the tread sections. o - a - d -

Folio No. _____

Serial No. 515, 758

Applicant.

Address.

Thomas A. Edison,

Llewellyn Park,

West Orange, N. J.

Title Rectifiers.

Filed Oct. 7, 1910.

Examiner's Room No. 105

Assignee Thomas A. Edison, Inc.

Ass't Exec. June 30, 1916 Recorded July 7, 1916 Liber 5127 Page 52

Patent No. 1099841

Issued June 9, 1914

ACTIONS.

- | | |
|-------------------------------------|----|
| 1 <u>Replied Nov. 8, 1910</u> | 16 |
| 2 <u>Amended Nov. 1, 1911</u> | 17 |
| 3 <u>Rejected Jan. 31, 1912</u> | 18 |
| 4 <u>Amended Jan. 11, 1913</u> | 19 |
| 5 <u>Rejected Feb. 25, 1913</u> | 20 |
| 6 <u>Amended Feb. 28, 1914</u> | 21 |
| 7 <u>allowed Apr. 6, 1914</u> | 22 |
| 8 <u>Final fee due Oct. 6, 1914</u> | 23 |
| 9 <u>Final fee paid May 8, 1914</u> | 24 |
| 10 | 25 |
| 11 | 26 |
| 12 | 27 |
| 13 | 28 |
| 14 | 29 |
| 15 | 30 |

FRANK L. DYER,

Counsel,

ORANGE, NEW JERSEY.

9/14/10

This invention relates to Current Rectifiers of the Commutator Type, in which a Rotating Commutator is driven in synchronism with the alternating current to be rectified.

The object is to provide means for securing the best adjustment of the commutator under widely varying conditions and when shifting of the contact brushes will not give the results desired. It is particularly intended for rectifiers used in charging storage batteries of various capacities and voltage.

Figure 1 shows the circuit conditions when a rectifier of this type is supplying a non-inductive circuit with no counter-electromotive force. In this case the active segment and brush contact should remain in circuit until the voltage of the rectified current wave falls to zero as shown; and in this case the length of the segment should equal E. F.

Figure 2 shows the same device used in charging a battery of considerable voltage. In this illustration "A" is ^{the} a zero line of the rectified wave, "B" is the line of battery voltage, which, for illustration, is shown as 60 volts.

To secure sparkless operation it is evident that contact between the brushes and the active segment of the rectifying commutator should not be made until the voltage of the incoming charging wave equals at least 60 volts, when there will be no difference of potential between the brushes and active segment, and there will be no sparking. The same conditions should obtain when the circuit is broken on the active segment.

As shown in Figure 2, the relative length of the active segment when charging a 60-volt battery should be equal to G. H. Therefore, if such a rectifier is to be used under the two conditions specified, or on circuits of varying electrical conditions, means

(Page #2)

should be provided for varying the active length of the segment while the device is in operation.

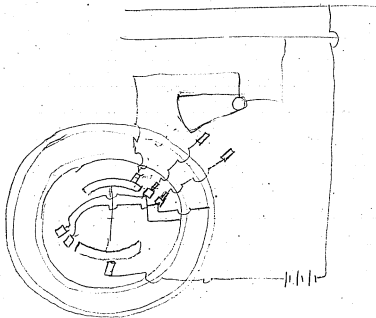
I accomplish this adjustment as shown in Figure 3, in which "H" is the extreme length of the active segment. This is made in sections, one section, "I", having the minimum length necessary for charging at the higher voltage. Additional sections, "K" and "K-1", insulated electrically from "I" are used. These are provided with means for connecting them to "I" when necessary, thus increasing the length of active segment when it is desired to increase the time of contact.

In order to allow for this adjustment while running I connect the section "K", "K-1" to slip rings, "L", "L-1"; contact brushes, "M", "M-1", connect to switch contacts "N", "N-1". A connection is also made between brush "M-2" and the switch blade, "O". When operating, as shown in Figure 3, the active length of segment is equal to "I". Now if it is desired to increase the active length of segment, the switch "O" is moved in the direction of the arrow so as to connect successively contacts "N", "N-1", thus connecting electrically sections "K", "K-1" to "I", and therefore increasing the total active length of segment to that of "H" as shown.

I do not limit myself to any particular number of adjustment sections, "K", "K-1", but may use one or more.

X The claim should cover, broadly, a Rectifying Commutator having one or more active segments with means for adjusting the length of contact arc of the active segment while in operation.

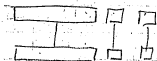
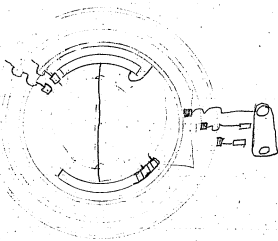
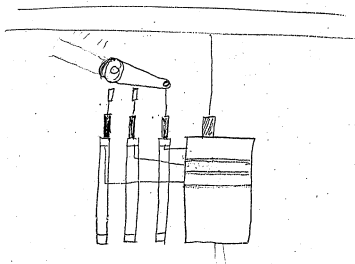
La E.

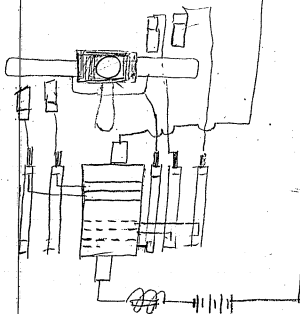


2nd 6. Vacuum
Re. 15 1945

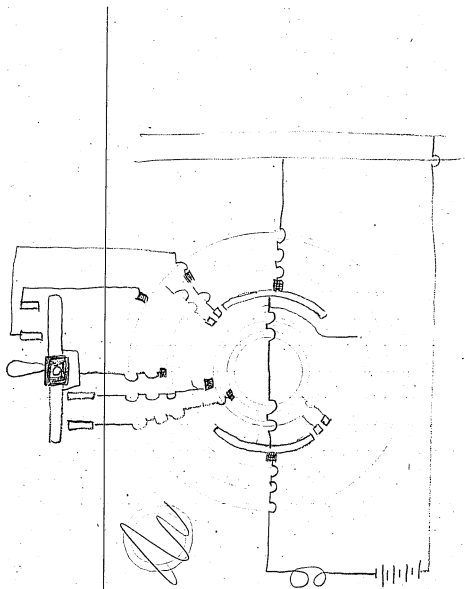
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Incomplete





7A.E.
D.M. Bliss
Sept 24-1910
Victor Dyer Smith



7.0.2.

DM Bliss

Sept 24-1910

Nathan Dyer Smith

Folio No. 655

Serial No. 588982

Applicant. Thomas A. Edison

Address. _____

Title Sound Records

Filed Oct. 25-1910 Examiner's Room No. _____

Assignee _____

Ass'g't Exec. _____ Recorded _____ Liber _____ Page _____

Patent No. _____ Issued _____

ACTIONS.

1	Rejected Nov. 16, 1910.	16	<i>See Exhibit</i>
2	Amended Nov. 3, 1911.	17	
3	Rejected Dec. 1, 1911.	18	<i>See Exhibit</i>
4		19	
5		20	
6		21	
7		22	
8		23	
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14		29	
15		30	

FRANK L. DYER,
Counsel,
Orange, New Jersey.

J. A. Z.

Finely ground flake
graphite - particles so small
as to produce no sound
Crushed Rock
Dust or Cylinder

Smother - diminish
friction of joint to prevent
chattering - Also reduces
wear.

Brushed on hard - Very
fine brush to get to bottom
of recesses when very hard
material is used - With
wear recesses brush need
not be so hard.

Recd, D.S., Oct 17 1910

Petition.

To the Commissioner of Patents:

Our Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, West Orange, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

SOUND RECORDS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer
(Registration No. 560), of Orange, New Jersey, his attorney, with full
power of substitution and revocation, to prosecute this application, to make
alterations and amendments therein, to receive the patent, and to transact all
business in the Patent Office connected therewith.

655
Thomas A. Edison

S P E C I F I C A T I O N

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States, and a resident of Llewellyn Park, West Orange, Essex County, New Jersey, have invented certain new and useful improvements in SOUND RECORDS, of which the following is a description:-

My invention relates to sound records, and my object is to provide commercial duplicate sound records, the record surface of which is more durable under the wearing action of the reproducing stylus and presents a smoother surface to the stylus than in other duplicate sound records with which I am familiar, and also prevents wear of the stylus or jewel. I accomplish this result by brushing finely divided flake graphite upon the record, the graphite being brushed into the sound grooves sufficiently hard to entirely cover the same with a thin adhesive coating of the graphite. The particles of the graphite should be sufficiently small to produce no sound when passed over by the reproducing stylus in tracking the record. My invention is applicable equally to disk and to cylindrical sound records of any type and formed of any of the well known record compositions, such as the records of wax-like or metallic soap composition well known in the art.

Attention is hereby directed to the accompanying drawings forming part of this specification, in which Fig-

ure 1 represents a cross section through a disc sound record embodying my invention, and Figure 2 is an enlarged sectional detail of the same.

The record 1 is formed with record grooves 2, the surfaces of which, as well as of the spaces between the grooves, being coated with the thin layer of graphite 3. The graphite should be finely ground or otherwise divided and applied with a fine brush in order that the bottom of the record grooves may be reached, the graphite being thoroughly brushed into the same. By this means a commercial record is obtained, and one having considerably greater wearing qualities in use than a record which has not been treated in the manner described. Also the friction of the reproducing stylus upon the record is diminished and chattering of the stylus thereby prevented.

Having now described my invention, what I claim and desire to protect by Letters Patent is as follows:-

Cancelled 11/3/11
1. As a new article of manufacture, a duplicate sound record having a thin coating of graphite formed upon the record-bearing surface thereof, substantially as described.

Cancelled 11/3/11
2. As a new article of manufacture, a molded duplicate sound record having a thin protective coating of finely-divided flake graphite formed upon the record surface and comprising a wearing surface therefor, substantially as described.

Insert "A" 11/3/11

This specification signed and witnessed this 21st day of October 1900

Thomas A Edison

Witnesses:

1. Walter Smith
2. Anna P. Kuhn

Oath.

State of New Jersey } ss.
County of Essex }

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, West Orange, Essex County, New Jersey

that he verily believes himself to be the original, first and sole inventor of the improvements in

SOUND RECORDS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Thomas A Edison

Sworn to and subscribed before me this 21 day of October 1900

Anna P. Kuhn

[Seal]

Notary Public.

NOTARY PUBLIC, STATE OF NEW JERSEY
COMMISSION EXPIRES, JUNE, 1910.

Accepted
655 J 181
17

588982

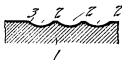
Div. 23.

141
2
(10)

Fig. 1



Fig. 2



Witnesses:

Frank D. Lewis
Dyer Smith

Inventor:

Thomas A. Edison
by Frank L. Rice
His Atty.

Div. 2, Room 379
Address only
"The Commissioner of Patents,
Washington, D. C."

2-280

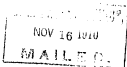
Paper No. 2, 1910.
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

J. H. D., -S.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

Nov. 16, 1910.

Thomas A. Edison,
Care Frank R. Dyer,
Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application.

for Sound records, filed October 25, 1910, serial number 508,982.

655

E. B. Moore

Commissioner of Patents.

This application has been duly examined.

Both of the claims are rejected as covering nothing of patentable subject matter. It is held that there is no invention in applying a surface of graphite to a duplicate record as is commonly done to the master record; see Lambert, March 20, 1900, #645,920, (181-14), or Norcross, March 22, 1910, #952,753, (181-14), especially in view that it is old to have a record surface of graphite; see Adams-Randall, English patent, Jan. 21, 1889, #1058, (181-2), and in view that it is very common to give a duplicate record a special surface, see Hoyt, et al., January 2, 1906, #808,843, or Lambert, Dec. 18, 1900, #664,223, both in (181-17).

Smith: If this is
drawing of Grapholā
lucida, doesn't Grapholā
actually get embedded
to a microscopic
extent in the material?

Bygones

*Backhouse; Schmidt
The S. is right &
that case is broken.
— there is some
points in it have you
men of graphite?
think if you had better
work, but why not
try it on and see what
happens? Aff*

Mr. Dyer:

This application (Folio 655), which covers a duplicate sound record having a thin protective coating of finely divided graphite formed upon the record surface thereof and comprising a wearing surface therefor, has been rejected on the ground that "there is no invention in applying a surface of graphite to a duplicate record as is commonly done to the master record." The principal reference cited is the patent to Norcross #952,753 granted on March 22, 1910.

In lines 93 to 100, Norcross after referring to the operation of the burnishing brush 4 disclosed by him, states: "The particles of graphite upon the record are thus compacted and caused to lie close together and to the surface of the record; furthermore, the coating of the graphite is burnished so that it has a bright smooth surface resembling an enamel and such that the coating is impervious to moisture and will not be materially affected if touched with the fingers." While the invention of Norcross is directed "to that portion of the operation of making duplicate sound records from an original which consists in preparing the surface of the original record by coating with an electro-conductive substance so that a matrix may be made thereon by electroplating," the article produced by the said patentee is identical in structure with the record

-2-

November 2, 1911.

of Edison and could obviously be used directly for the re-production of sound.

Both Mr. Holden and I are of the opinion that there is nothing patentable in this case. Please advise me whether or not to drop the same.

FB-KGE

Fredrick Bachmann.

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
SOUND RECORDS,)
Filed October 25, 1910,) Room No. 379.
Serial No. 588,982.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of November 16,
1910, please amend the above entitled case as follows:

cancel the claims and substitute in place
thereof the following claim:

a.
As a new article of manufacture, a molded
duplicate sound record having a thin protective coating of
flake graphite formed upon the record surface and comprising
a wearing surface therefor, the graphite being in such a
fine state of division as not to produce any sound when
passed over by a reproducing stylus in tracking the record,
substantially as described.

R E M A R K S

The new claim specifies that the graphite is in
such a fine state of division as not to produce any sound
when passed over by a reproducing stylus in tracking the
record. None of the references discloses this feature
and none, in fact, discloses a duplicate sound record having

a protective coating of graphite. It is thought that invention is involved in the application of the graphite to the surface of the record in such a condition as to adapt the record for a use not contemplated in the prior patents disclosing a graphite surface layer.

Respectfully submitted,

Orange, New Jersey,
November 3, 1911.

THOMAS A. EDISON,

By Frank R. Dyer
HIS ATTORNEY.

Div. 23, Room 379

9-200

Address only
"The Commissioner of Patents,
Washington, D. C."

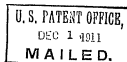
Paper No. 1011
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

J.H.D.-S.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

Dec. 1, 1911.

657
Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application.

for Sound Records, filed October 25, 1910, serial number
588,982.

E. B. Moore

Commissioner of Patents.

This action is responsive to the amendment filed
Nov. 4, 1911.

The claim is rejected as specifying no more than Capps,
et al., Feb. 28, 1905, #783,420, (181-16) "quasi originals", prepared
for duplication in the customary manner. Attention is also
directed to Hoyt, October 15, 1907, #867,975, (181-16).

540

Folio No. 674

Serial No. 596,007

Applicant.

Thomas A. Edison

Address.

*Menlo Park,
New Jersey*

Title

Turning Machine

Filed *December 7, 1910*

Examiner's Room No.

Assignee

Thos A. Edison, Inc.

Ass'g't Exec.

June 5, 1916

Recorded

June 7, 1916

Liber *S, 100*

Page *217*

Patent No. *1,184,332*

Issued

May 23, 1916

ACTIONS.

- 1 *Rejected Jan. 11, 1911* 16
- 2 *Amended Dec. 22, 1911* 17
- 3 *Supplemental amt Jan. 2, 1912* 18
- 4 *Rejected Jan. 26, 1912* 19
- 5 *Amended Jan. 6, 1913* 20
- 6 *Rejected Feb. 5, 1913* 21
- 7 *Amended Jan. 8, 1914* 22
- 8 *Rejected Feb. 25, 1914* 23
- 9 *Amended Feb. 23, 1915* 24
- 10 *Rejected March 6, 1915* 25
- 11 *Associate power of attorney to Dyar & Holden* 26
- 12 *Amended Feb. 23, 1916* 27
- 13 *Allowed March 6, 1916* 28
- 14 *Final Fee Due Sept. 6, 1916* 29
- 15 *" " Paid April 25, 1916* 30

*Dyar & Holden
Associate
Attorneys*

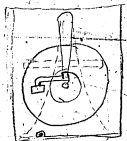
FRANK L. DYER,

Counsel,

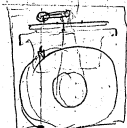
Orange, New Jersey.

Scheffel —

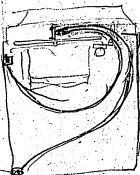
No 1



Center



Center



Center

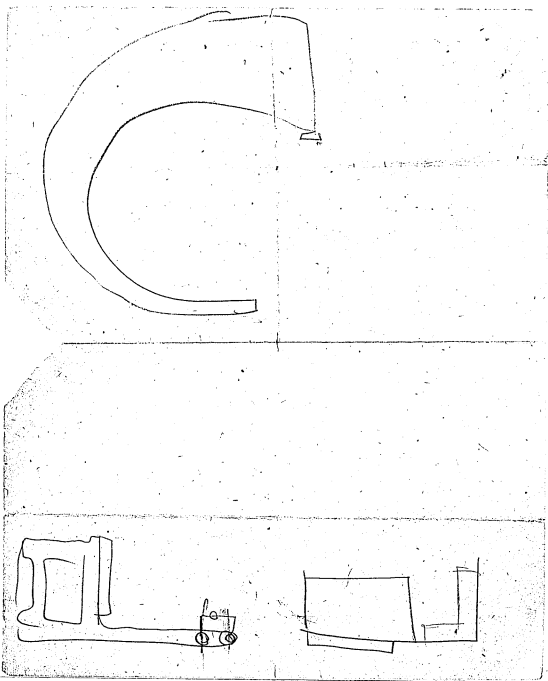
~~Scheffel~~
Oct 25-1910

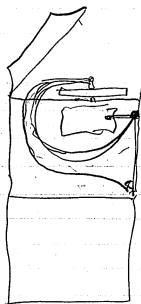
D. Holden
Oct 27. 1910

122

G. L. L.
Randy Lewis
Nov. 9 1910

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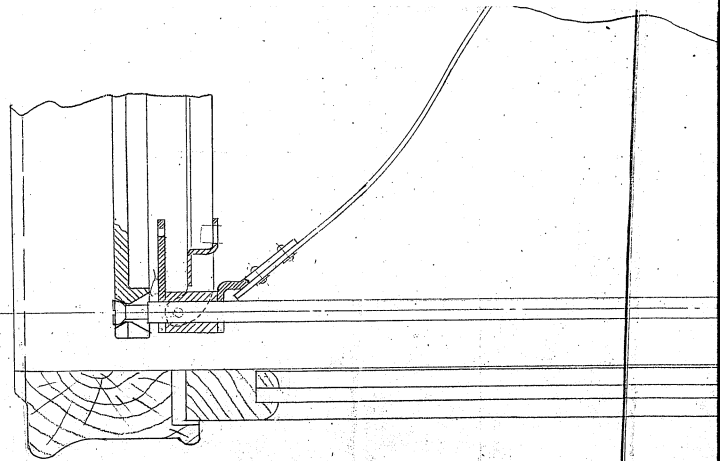
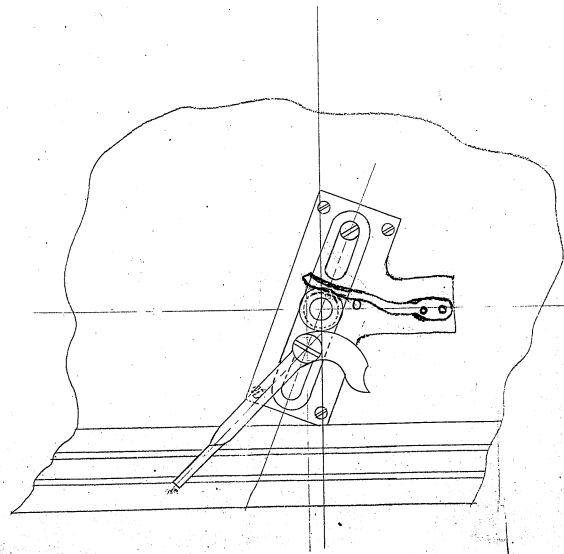


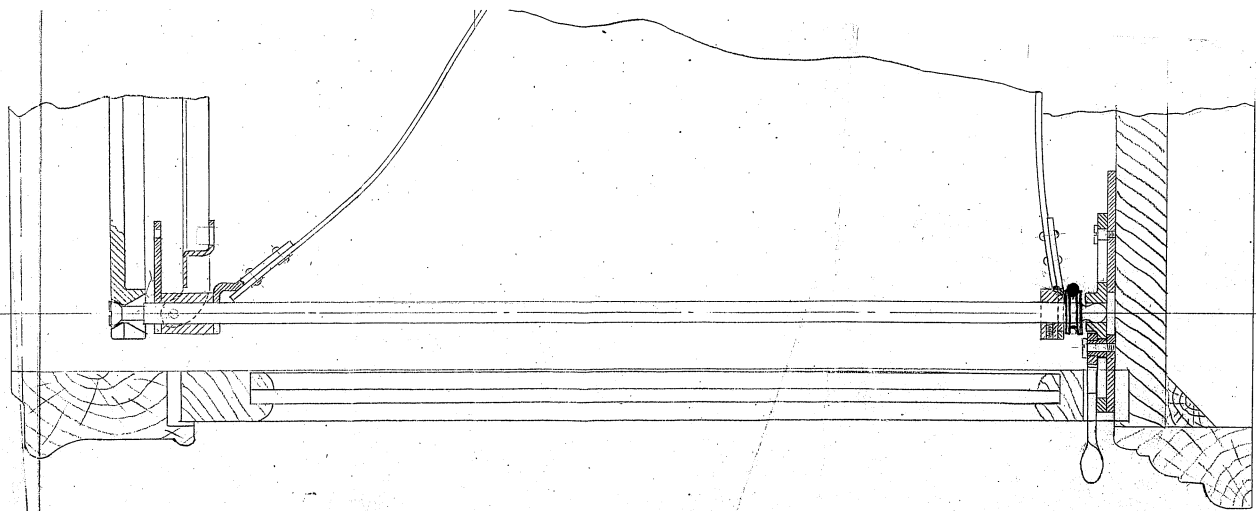
D. Holden

Nov. 9 - 1910

C. H. L.

Revised Design
Nov 9 1910





649

Folio No. 649Serial No. 596,536

Applicant.

Address.

Thomas A. EdisonTitle Round ModifiersFiled Dec. 9, 1910

Examiner's Room No. _____

Assignee

New Jersey Patent CoAss'g't Exec. Aug. 13/14 Recorded Aug. 14, 1914 Liber 795 Page 326Patent No. 1,110,982 Issued Sept. 15, 1914

ACTIONS.

1. Rejected Jan. 13, 1911. 10
2. Amended Dec. 29, 1911. 17
3. Rejected Feb. 1, 1912. 18
4. Amended Jan. 9, 1913. 19
5. Rejected Feb. 12, 1913. 20
6. Amended Dec. 31, 1913. 21
7. Allowed Feb. 14, 1914. 22
8. Final fee due Aug. 14, 1914. 23
9. Amended under Rule 78 - Feb. 5, 1914. 24
10. Amendment refused admission. Feb. 11, 1914. 25
11. _____ 26
12. _____ 27
13. _____ 28
14. _____ 29
15. _____ 30

VAULT

FRANK L. DYER,

Counsel,

Orange, New Jersey.

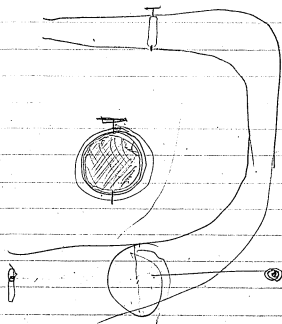
FG49

Modifed

Extension

Rev by Lewis

Mar. 16, 1910



Legal Dept.

Has the pivoted horn application
been finished - F673 -

Has Sound Modifier app
been prepared F649

Want a new battery tray
application prepared. F-

Want a new record + processing
patented Edison will
Explain -

Has the Applow for drawer in F625
Amberala with disc records been
prepared Edison

Direct transmission
Appl in comp. files
for the Record
and Apparatus

Legal Dept

Get busy on the
application for

Regulating Volume
of Funds on Disc

I sent it to your Dept
a long while
ago - want to
get it issued
Zach

Folio No. 675

Serial No. 596,527

Applicant.

Address.

Thomas A. Edison

Title Dye Brand Records

Filed Dec 9, 1910

Examiner's Room No. _____

Assignee _____

Ass'g't Exec. _____

Recorded _____

Liber _____

Page _____

Patent No. _____

Issued _____

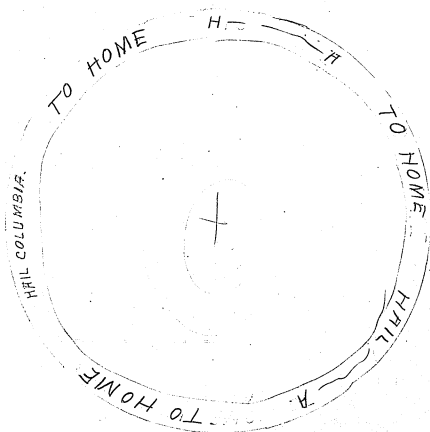
ACTIONS.

1	<u>Office letter Jan. 13, 1911.</u>	16
2	<u>Amended Dec. 22, 1911</u>	17
3	<u>Revised Jan. 25, 1912</u>	18
4	<u>Amended December 27, 1912</u>	19
5	<u>Revised January 29, 1913</u>	20
6		21
7		22
8		23
9		24
10		25
11		26
12		27
13		28
14		29
15		30

FRANK L. DYER,

Counsel,
Orange, New Jersey.

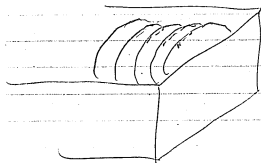
Received by Dyer Smith
July 27 1910
J. Q. E.



July 20-1910

FUTS

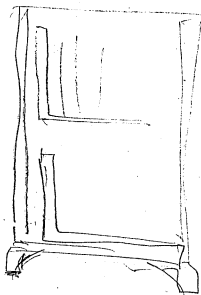
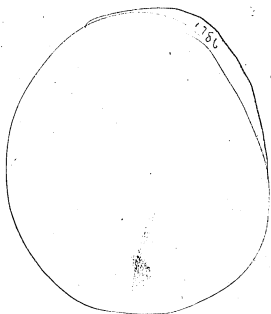
Wally Central



Records will names on each
side as the records will not
have to be turned over to find out
the title - applies to double disk
records.

L.H.

Wally Lewis
Nov. 16/9/10



Orrell - 1
3rd 4th floor
near entrance

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llewellyn Park, West Orange, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

DISC SOUND RECORDS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration No. 560), of Orange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thomas A. Edison

S P E C I F I C A T I O N

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, West Orange, Essex County, New Jersey, have invented certain new and useful improvements in DISC SOUND RECORDS, of which the following is a description:-

My invention relates to sound records of the type in which the record is formed upon the face or faces of a flat record, as the well known disc records in which the record groove is in the form of a spiral, a blank surface being left about the periphery outside the record surface and a blank surface also being left adjacent the center of the record inside the smallest spiral of the record surface. It is customary to mark the name of the selection or other identifying data therefor upon the blank surface adjacent to the center of the record. I contemplate marking the name of the selection or other identifying data on the blank surface outside the record and adjacent the periphery, and preferably repeating the indicia at intervals around the periphery, so that the same may readily be seen when the record is stacked with others in a drawer or filing cabinet constructed according to my invention, regardless of whether one portion or another of

the periphery of the record is uppermost in the filing cabinet. Another feature of my invention has regard to the marking of identifying data upon records of the character described having different records formed upon the opposite sides thereof. For example, a particular song might be recorded on one side of the record, and a particular band selection upon the other side of the record. According to my invention, the title of the song and the title of the band selection would be printed upon each side of the record adjacent to the periphery thereof but in different sizes of type, or with other readily discernible differences, so that any one viewing one side of the record would immediately know, for example, that the particular song was recorded upon that side and the particular band selection upon the reverse side of the record. My invention also contemplates the construction of a filing cabinet or drawer of such character that the titles of records of the character described placed or stacked therein, may readily be seen without the necessity of lifting the records from their compartments to read the title. Other objects of my invention reside in the construction of parts and combinations of elements more fully described in the following specification and appended claims.

For a fuller comprehension of my invention, attention is hereby directed to the accompanying drawing, forming part of this specification, and in which -

Figure 1 represents in plan view a disc sound record embodying my invention;

Figure 2 represents a front elevation of a drawer for holding records such as illustrated in Figure 1 and embodying my invention; and

Figure 3 represents a cross section taken on line 3-3 of Figure 2.

In the drawings, the record 1 has a selection or recorded matter 2 formed upon the face thereof, the blank space 3 being left between the center hole 4 and the innermost record groove, while the blank space 5 surrounds the outermost record groove and extends from the same to the periphery of the record. The title of the selection recorded at 2 upon the front of the record is indicated by the words "Song - Red Wing-" printed upon the blank space 5 adjacent the periphery of the record, as indicated at 6. This title is preferably repeated at intervals around the periphery of the record, as indicated at 7 and 8. Also, preferably, the title of the selection recorded upon the opposite or reverse side of the record is also indicated upon the front of the record as by the words "Band - Marche Tartare", as shown at 9, this title also being printed upon the blank space 5 adjacent the periphery of the record and preferably also repeated at intervals around the periphery, as indicated at 10 and 11. The fact that the song indicated at 6 is recorded upon the front of the record and the band selection indicated at 9 is recorded upon the opposite side of the record, is shown in the drawing by printing the title of the song in larger letters than the title of the band selection. It is obvious, however, that the distinction between the titles of the records

upon the front and back may be indicated in other suitable ways. The titles of the song and the band selection would be printed similarly upon the reverse side of the record on the blank space thereon corresponding to 5 with the difference that the band selection title would be printed in large letters upon that side and the song in small letters to indicate that the band selection was the record formed on that side. Or the titles of the two selections might be printed in the same size and character of type with the words "On back" or the like adjacent the title of the record formed upon the other side of the disc, or the titles of the two records might be printed in type of the same size but of different character, or other distinctions might be made.

I have illustrated at 12 a drawer or filing cabinet suitable for the reception of records such as that illustrated in Figure 1. The receptacle 12 is provided with a plurality of short vertical spacing members 13 between which the records may be placed, one record being slipped between each two spacing members. Members 13 are of a height less than the diameter of the records adapted to be placed therebetween, so that an unobstructed view of the upper edges of the records may be had. Also, the members 13 should be of a thickness sufficient to space the records apart a considerable distance, as shown in Fig. 3, so that the titles adjacent to the edges of the records may be clearly legible from in front and above, without moving the records. The members 13 may be spaced far enough apart to permit a slight tilting of the records, if desired. The space between members 13 should not, however,

be sufficiently great to permit two records being slipped into the same space. Preferably, the front 14 of the cabinet or drawer is cut away at its upper central portion as shown at 15 to permit a good view of the titles of the records in the compartments. Records of different diameters may be stacked in the receptacle, if desired, the largest records being placed at the back. As illustrated, a person, the position of whose eye is represented diagrammatically at 16, may look down upon the records in the receptacle and read the title of each, as indicated by the lines of vision 17, without lifting the records from the cabinet.

Having now described my invention, what I claim and desire to protect by Letters Patent is as follows:-

1. As a new article of manufacture, a ^{disc} ~~flat~~ sound record having different records formed upon the two sides thereof and having indicia upon one side for identifying both records, the indicia for one record being of a character readily distinguishable from the indicia for the other record, substantially as described.

2. As a new article of manufacture, a disc sound record having different records formed upon the two sides thereof and having indicia upon each side for identifying the records on both sides, the indicia for designating the record on the opposite side of the disc from said indicia being of a character readily distinguishable from the indicia for designating the record on the same side of the disc, substantially as described.

3. As a new article of manufacture, a disc sound record having different records formed upon the two sides thereof and having printed characters adjacent to the periphery of the disc on one side thereof, for identifying both the record on the same side and on the opposite side of the disc, the characters designating one record being distinguished from the characters designating the other record in such a manner as to indicate to which record the characters refer, substantially as described.

4. As a new article of manufacture, a disc sound record having the title thereof ^{12/27/11} printed adjacent to the periphery thereof recurrently at intervals around the said periphery, substantially as described.

Revised from Disc A claims 6-7
5. In a device of the character described, in combination, a receptacle for containing disc sound records having means for holding the records upright and separated one from the other in such manner that the face of each record adjacent its periphery may be readily seen from a point in front of and above the receptacle, and a plurality of records placed in said receptacle between said means, and having identifying indicia on their faces adjacent their peripheries, substantially as described.

6. In a device of the character described, a receptacle for containing disc sound records having parallel spacing members of a height less than the diameter of a disc record adapted to be placed between two spacing members, the said members being sufficiently thick to space

Cancelled 11/1/11
apart ^{and} records placed therebetween in such manner that the face of each record adjacent its periphery may be seen readily from a point in front of and above the receptacle, the said members being separated by a distance somewhat greater than the thickness of ^{one of said} a record adapted to be placed therebetween, but less than the thickness of two such records, substantially as described.

The elements of Claim 1
7. In a device of the character described, a receptacle for containing ^{sound} disc sound records having parallel spacing members of a height less than the diameter of a disc record adapted to be placed between two spacing members, the said members being sufficiently thick to space apart ^{and} records placed therebetween in such manner that the face of each record adjacent its periphery may be seen readily from a point in front of and above the receptacle, the said ^{and} members being separated by a distance sufficiently great for the insertion of ^{one of said} a record therebetween, but less than the thickness of two such records, said receptacle also having a front member parallel to the spacing members, and cut away at its upper central part in such a manner as to expose to view the upper edges of ^{the} records placed between said spacing members, substantially as described.

Insert A' - Claim 8 11/22/11

*C. F.
C. G. & H.
C. J. & H.*

This specification signed and witnessed this 7th day of December 1900

Thomas A. Edison

Witnesses:

1. Dyer Smith

2. Anna P. Keeley

Oath.

State of New Jersey } ss.,
County of Essex

THOMAS A. EDISON, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, West Orange, Essex County, New Jersey

that he verily believes himself to be the original, first and sole inventor of the improvements in

DISC SOUND RECORDS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Thomas A. Edison

Sworn to and subscribed before me this 7th day of December 1900

Anna P. Keeley

Notary Public.

[Seal]

3 Accounts $\frac{181}{17}$ 675

596537

$\frac{158}{910}$

Fig. 1

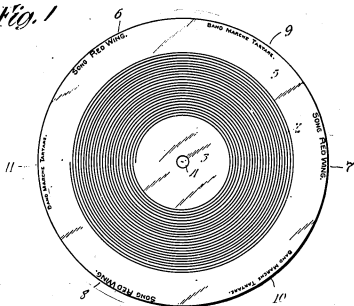


Fig. 2

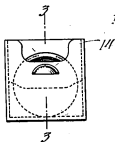
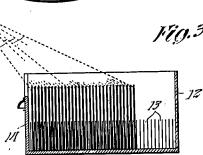


Fig. 3



Witnesses:

Frank D. Lewis
Dyer Smith

Inventor:

Thomas A. Edison
By Lewis & Brown
His Atty.

Div. 25 Room 379

2-800

Address only
"The Commissioner of Patents,
Washington, D. C."

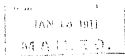
J. H. D.-S.

Paper No. 1, Letter
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON

Jan. 13, 1911.

Thomas A. Edison,
Care Frank T. Dyer,
Orange, New Jersey.



Please find below a communication from the EXAMINER in charge of your application.

for Disc Sound Records, filed Dec. 9, 1910, serial number 596,537.

E. B. Moore

Commissioner of Patents.

This application has been duly examined.

"1" and "15" are not on the drawing.

Claims 1 to 4 inclusive are drawn to a sound record,
per se, while claims 6 and 7 are drawn to a container.
Division is required according to the provisions of Rule 42.

Claim 5 is drawn to the combination of a record and
container. This claim if retained in either of the above noted
groups will be rejected as an aggregation, there being no
patentable combination between the record and its container.

In amending this case, applicant should consult
the following references:

Guillemon, French patent, #393,472, (181-3);

Thomas, Eng. patent, Aug. 8, 1905, #16,129, (181-17).

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
DISC SOUND RECORDS,)
 Room No. 379.
Filed December 9, 1910,))
Serial No. 596,527.))

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of January 13,
1911, please amend the above entitled case as follows:

Rewrite claims 5, 6 and 7 as follows:

Amended 127, 2 - rewritten Serial B 147, 4-6
- 5. In a device of the character described, the combination of a plurality of disc sound records having identifying indicia on their faces adjacent their peripheries, and a receptacle containing said records having means for holding the same upright and separated one from the other in such a manner that the face of each record adjacent its periphery may be readily seen from a point in front of and above the receptacle, substantially as described. -

- 6. In a device of the character described, the combination of a receptacle having parallel spacing members, and a plurality of disc sound records placed between said spacing members and having identifying indicia on their faces adjacent their peripheries, said members being of a height less than the diameter of said records, being sufficiently thick to space apart said records in such a manner that the face of each record adjacent its periphery may be readily seen from a point in front of and above said receptacle, and being separated by a distance somewhat

greater than the thickness of one of said records, but less than the thickness of two of said records, substantially as described.

7. In a device of the character described, the combination of a receptacle having parallel spacing members, and a plurality of disc sound records placed between said spacing members and having identifying indicia on their faces adjacent their peripheries, said members being of a height less than the diameter of said records, being sufficiently thick to space apart said records in such a manner that the face of each record adjacent its periphery may be seen readily from a point in front of and above the receptacle, and being separated by a distance sufficiently great for the insertion of one of said records therebetween but less than the thickness of two of said records, said receptacle also having a front member parallel to the spacing members and cut away at its upper central part so as to expose to view the upper edges of the records, substantially as described. - *Claim 7 B. Adams & Co. 1/17/12*

Insert the following as claim 8:

Cancelled 12/27/16 - Reissued Patent B-13,271,12
8. In a device of the character described, the combination of a receptacle having parallel spacing members, and a plurality of disc sound records placed between said spacing members and having identifying indicia on their faces adjacent their peripheries, said members being of a height less than the diameter of said records and being sufficiently thick to space apart said records in such a manner that the face of each record adjacent its periphery may be seen readily from a point in front of and above the receptacle, substantially as described. *Adams & Co.*

R E M A R K S

The Examiner is respectfully requested to apply the reference character 1 to the record in Figure 1, and the reference character 16 to the recess in the member 14 in Fig. 2.

The requirement for division made by the Examiner has been complied with and action on the merits of the claims now in the case is respectfully requested. The right is reserved to file a divisional application on the subject matter of the canceled claims.

Referring to the Examiner's statement that there is no patentable combination between the record and its container, it is pointed out that neither of the references cited by the Examiner discloses the combination of disc records and a container therefor, as set forth in claims 5 to 8 inclusive, by reason of which combination it is possible to read the identifying data from the face of the record itself without withdrawing the latter from the container. This combinable relation is thought to be new; and in the absence of a reference disclosing the same, the applicant is thought to be entitled to the combination claims herein presented.

Respectfully submitted,

Orange, New Jersey,
December 22, 1911.

THOMAS A. EDISON,
By Frank L. Dyer
his Attorney.

Div. 23 Room 379

2-200

Address only
"The Commissioner of Patents,
Washington, D. C."

Paper No. Raj.

All communications respecting this
application should give the serial number,
date of filing, and title of invention.

J.H.D.-S

DEPARTMENT OF THE INTERIOR

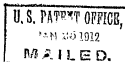
UNITED STATES PATENT OFFICE

WASHINGTON

January 25, 1912.

675-
Thomas A. Edison,
Care Frank L. Dyer,
Orange, New Jersey.

Care Edison Laboratory.



Please find below a communication from the EXAMINER in charge of your application.

for Disc Sound Records, filed Dec. 9, 1910, serial number 596,537.

E. D. Moore

Commissioner of Patents.

This action is responsive to the amendment filed Dec. 23,
1911.

Claims 1, 2, 3 and 4 are rejected upon Moses, Aug. 23, 1910,
#968,253, (211-Display Racks), Also it being old to place identi-
fying matter on the face of the record as in either Johnson,
Sept. 22, 1903, #739,318, or Wassenich, October 3, 1893, #505,910
(181-17), and to place identifying matter adjacent the periphery
of the record as in Thomas of record or Leube, French patent,
#334,330, June 20, 1903, (181-17), no patentable subject matter
can be found in applicant's claims or in applicant's construc-
tion. The location, representation, subject matter or
description of the identifying matter is held to be but
matters of variations of expediency wherever found desirable or
necessary and not amounting to invention.

Claims 5, 6, 7 and 8 are rejected as aggregations.
There is no patentable combination between the container and
the thing contained. This is especially true in view that it is
shown to be old to provide a display rack for phonograph
records.

Claims 5, 6, 7 and 8 are also rejected as not patentable

#596,537-----2.

over Moses of record; Hills, Nov. 17, 1908, #903,977, (211-Display Rack), or Kasik, July 18, 1899, #628,943, (45-File Racks).

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
DISC SOUND RECORDS,)
Filed December 9, 1910,) Room No. 379.
Serial No. 596,537.)

HONORABLE COMMISSIONER OF PATENTS,

S I R:

In response to Office action of January 25, 1913, please amend the above entitled case as follows:

In claim 1, line 1, change "flat" to

- disc - .

In claim 4, line 2, cancel "printed".

Cancel claims 5 to 8 inclusive and add the following new claims:

5. As a new article of manufacture, a disc sound record having different records formed upon the two sides thereof and having upon one side recurrently around the periphery thereof indicia for identifying both records, the indicia for one record being of a character readily distinguishable from the indicia for the other record, substantially as described.

6. As a new article of manufacture, a disc sound record having different records formed upon the two sides thereof and having upon one side recurrently around the periphery thereof indicia for identifying both records, the indicia for one record being in a different kind of type from the indicia for the other record, substantially as described.

7. As a new article of manufacture, a disc sound

record having different records formed upon the two sides thereof and having upon one side at the periphery thereof indicia for identifying both records, the indicia for one record being in a different kind of type from the indicia for the other record, substantially as described.

8. As a new article of manufacture, a disc sound record having recurrently around the periphery thereof indicia for identifying the record, substantially as described.

REMARKS

None of the references of record discloses a disc sound record having recurrently around the periphery thereof indicia for identifying the record; nor does any of the references disclose a disc record having different records formed on the two sides thereof and having on one side indicia for identifying both records, the indicia for one record being of a character readily distinguishable from the indicia for the other record. By repeating the indicia around the periphery, the same may be readily seen when the record is stacked with others in a drawer or filing cabinet regardless of whether one portion or another of the periphery of the record is uppermost or nearest the observer. By employing indicia of different characters, a person viewing one side of the record would immediately know which record was formed on each side of the disc. One or both of these features is brought out in each of the claims, and the latter are accordingly thought to be patentable.

Reconsideration and allowance are respectfully
requested.

Respectfully submitted,

THOMAS A. EDISON

By Frank L. Dyer
his Attorney.

Orange, New Jersey,

December 27, 1912.

Div. -23... Room.....379

2-900

Paper MS, Rej....

Address only
"The Commissioner of Patents,
Washington, D. C."
J.H.D.-Sut.

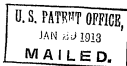
All communications respecting this
application should give the serial number,
date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON

January 29, 1913.

Thomas A. Edison,
Care Frank L. Dyer,
Orange, N.J.



Please find below a communication from the EXAMINER in charge of your application.

for Disc Sound records, filed Dec. 9, 1910, serial number 596,537.

60-5581

E.B. Moore

Commissioner of Patents.

This action is responsive to the amendment filed Dec. 28,
1912.

It is old in Moses of record or Moses, Dec. 3, 1912, #1,046,418,
(181-17) to place titles recurrently around the periphery of
the tablet. It is held patentably immaterial whether such
tablet be round or square. Moses discloses a double faced record
with the title of both selections on both faces. No invention
is found in employing any well known expedient to accentuate
the difference in the titles. Accordingly all of the claims
are rejected.

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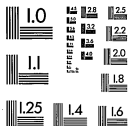
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